

PRIME HOOK NWR

NARRATIVE REPORT

1971

NARRATIVE REPORT

C.O.

PRIME HOOK NATIONAL WILDLIFE REFUGE

MILTON, DELAWARE

JANUARY - DECEMBER 1971

PRIME HOOK

National Wildlife Refuge



THINGS TO DO ON THIS REFUGE

FISH--four convenient sites.

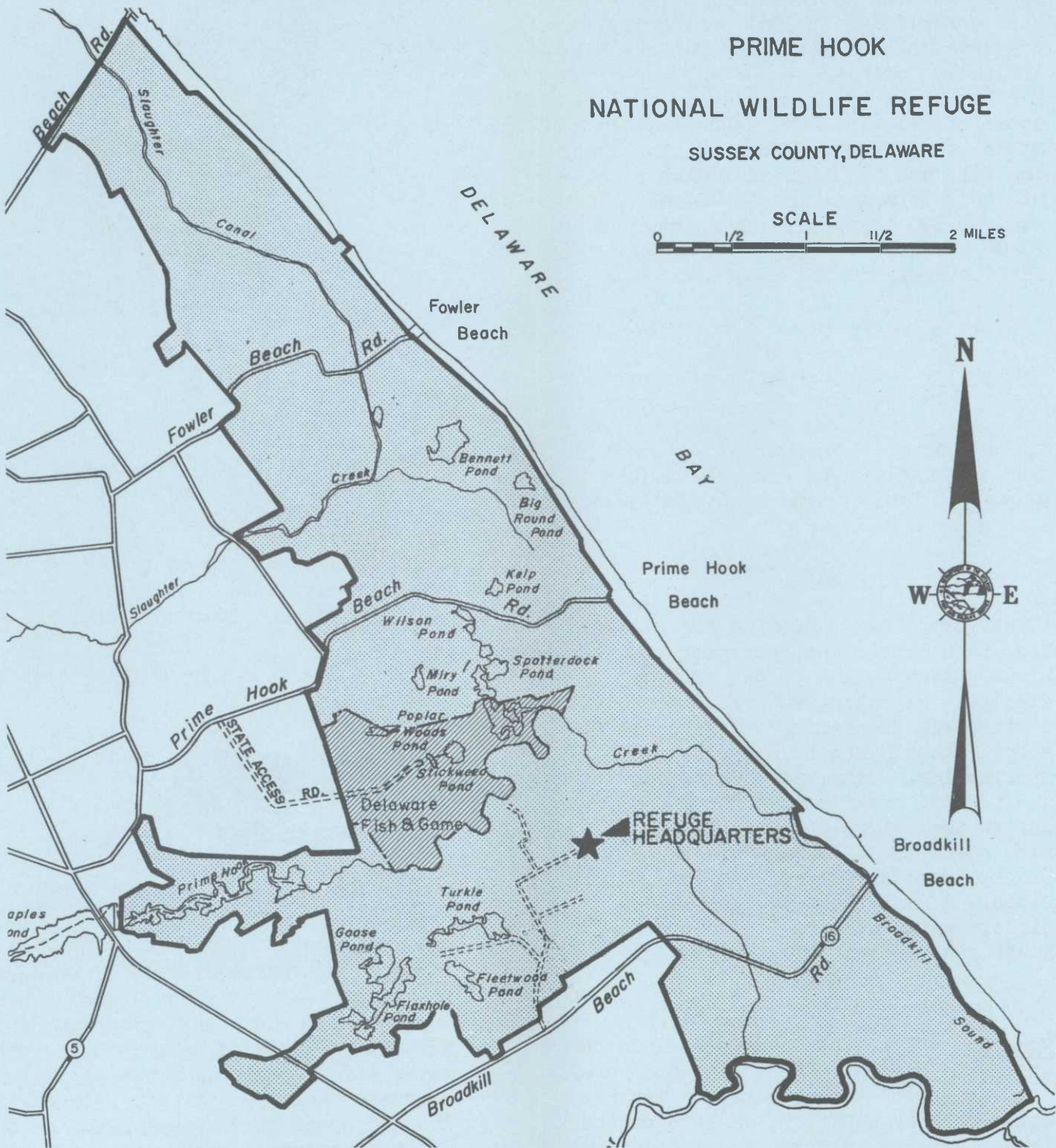
BOAT-LAUNCHING--four areas provided.

CANOEING--over 15 miles of canoe waterways.

OBSERVE & PHOTOGRAPH--waterfowl, shorebirds, muskrats, and many other species of wildlife in their natural habitat.

PRIME HOOK
NATIONAL WILDLIFE REFUGE
SUSSEX COUNTY, DELAWARE

SCALE
0 1/2 1 1 1/2 2 MILES



The Prime Hook National Wildlife Refuge was established in 1963 primarily to preserve coastal wetlands that are historically of high value as waterfowl habitat. It is located on the west shore of Delaware Bay, approximately 22 miles southeast of Dover, the State capitol, and 64 miles southeast of Wilmington, Delaware. The 10,700 acres include 7,300 acres of marsh and water; 1,200 acres of timber and brush; 2,100 acres of pasture and cropland.

Management. Since the marshes are now good waterfowl habitat, improvements will be essentially limited to scattered pothole development, provision for nesting sites, and production of crops as food for migratory waterfowl.

WILDLIFE

The varied marsh habitat of the Prime Hook Refuge provides homes for numerous birds, mammals, and fishes of many species. Migrating waterfowl concentrations in the spring and fall, on or about March 15 and November 1, are spectacular. Many waterfowl winter on the refuge, providing wintertime viewing to the nature enthusiast. The rare osprey nests along Prime Hook Creek, Broadkill River, and Petersfield Ditch. A variety of herons, shorebirds, terns, and song birds provides additional interest to the visitor.

Mammals. Resident mammals include the white-tailed deer, red fox and gray fox, raccoon, river otter, muskrat, opossum, gray squirrel, eastern cottontail, striped skunk, and woodchuck.



Muskrat houses are notable and abundant throughout the marsh areas. Their activities benefit waterfowl and other wetland species by their eating out small clearings into dense water-surface vegetation. Their houses provide nesting and loafing sites for waterfowl and other birds.

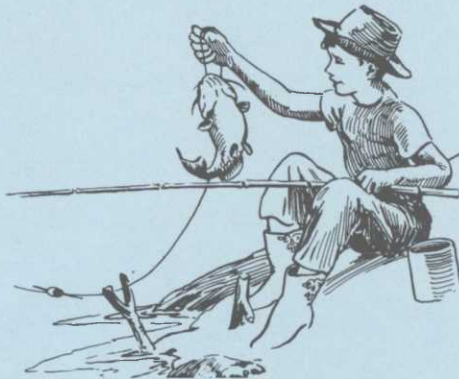


Birds. Of particular interest during migration are Canada geese, black ducks, mallards, and pintails, while several species of waterfowl and other waterbirds commonly nest in the marshes. A large variety of song and insectivorous birds may also be seen by the careful observer.

PUBLIC USES

FISHING--All freshwater streams and ponds throughout the refuge are open to sport fishing in accordance with state regulations. Largemouth bass and pickerel are most sought after and abundant. Favorite sites are Prime Hook Creek, Petersfield Ditch, Turkle Pond, and Fleetwood Pond.

Warm-water fish are plentiful in Turkle Pond, Fleetwood Pond, Headquarters Ditch, and Waples Pond. Large-mouth bass and pickerel are most popular with fishermen.



CANOEING--Over 15 miles of streams and ditches provide the canoe-enthusiast with hours of potential pleasure. Favorite routes are along Prime Hook Creek and Petersfield Ditch.

BOATING--Permitted in all freshwater areas. Boats may be launched from designated access points along public roads and at Turkle Pond, Fleetwood Pond, Headquarters Ditch, and Waples Pond.

SIGHTSEEING--Vehicle travel provides delightful sightseeing opportunity on refuge roads in all seasons. Frequently waterfowl and shorebirds are best observed from the shaded interior of an automobile.

HIKING--Hiking is permitted in all areas except those marked closed by posting. Hiking is a pleasurable and healthful exercise which provides the finest viewing of a refuge and its wildlife in undisturbed activities. Foot-access into wooded areas is best from Headquarters Road and Turkle Pond and Fleetwood Pond Roads.

PHOTOGRAPHY--The hiking trails and vehicle routes all offer excellent opportunities for wildlife photography. Waterfowl, shorebirds, muskrats, and many other species of wildlife may be observed relatively undisturbed in their natural habitat. The Broadkill Beach Road is excellent for observation of feeding shorebirds. Other areas of interest are along Slaughter Beach Road and Fowler Beach Road.

Hunting is permitted in certain seasons in accordance with state and special regulations. Further information is available at refuge headquarters.

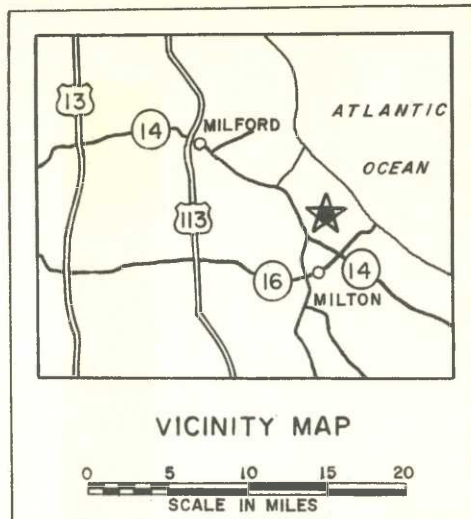
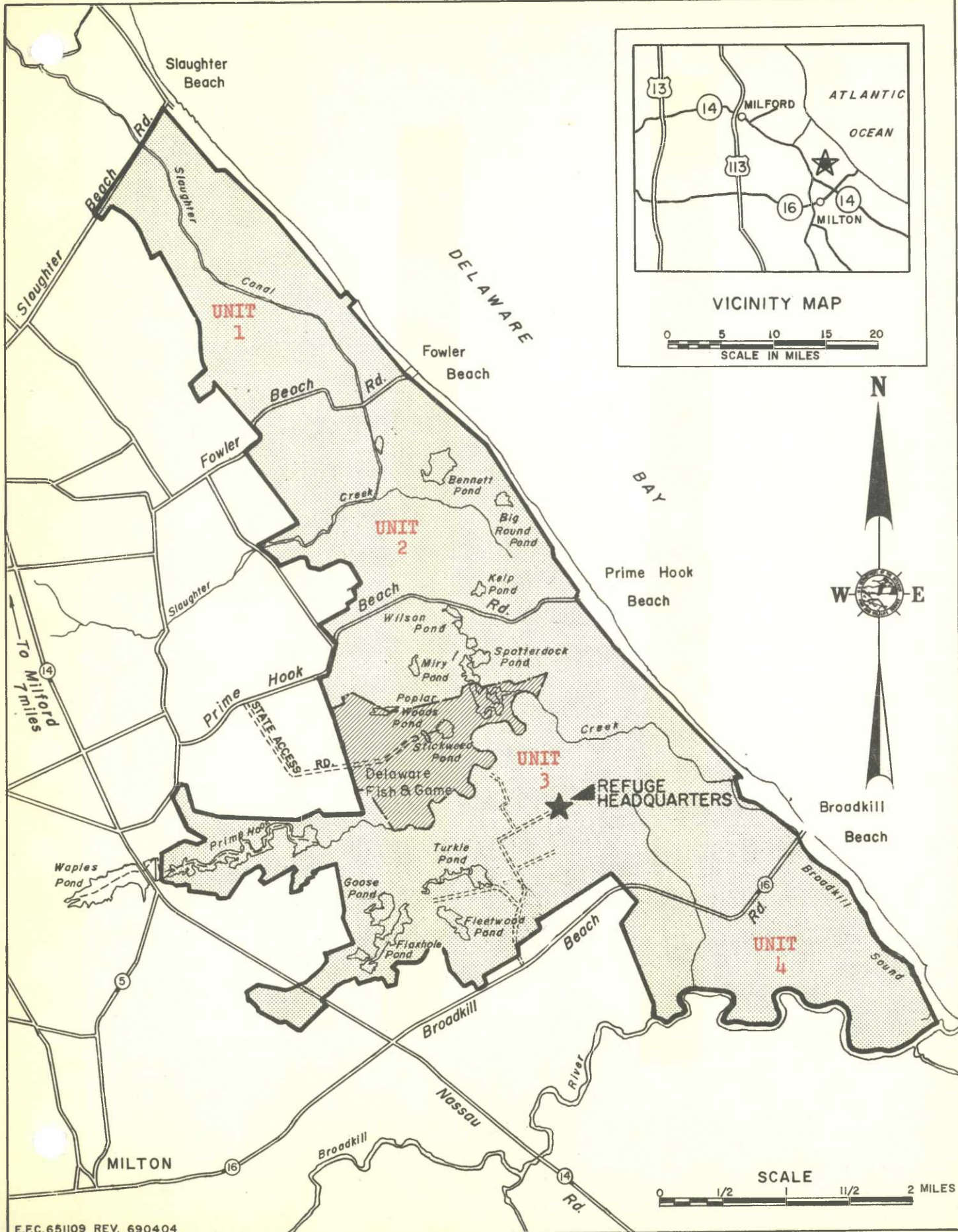
Additional information and current regulations may be obtained Monday through Friday at Refuge Headquarters located 1.6 miles north of Broadkill Beach Road, Route 16. Correspondence should be addressed to Refuge Manager, Prime Hook National Wildlife Refuge, Box 195, Milton, Delaware 19968. The telephone number is (302) 684-8419.

PRIME HOOK NATIONAL WILDLIFE REFUGE

SUSSEX COUNTY, DELAWARE

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



NARRATIVE REPORT

PRIME HOOK NATIONAL WILDLIFE REFUGE

JANUARY - DECEMBER 1971

REFUGE STAFF

Robert G. Nelson (To C.O. 08/21/71) Refuge Manager
Norman E. Holgersen (08/21/71 - 01/11/72) Acting Refuge Manager
Thomas J. McAndrews (EOD 01/11/72) Refuge Manager
Richard F. Nugent Asst. Refuge Manager
William H. Sipple Maintenceman
Otis J. Clifton Maintenceman
Eugene J. Moore (10/31/71 - 12/31/71) Laborer (Part-time)

Norman E. Holgersen (Stationed at Bombay Hook) . . Wildlife Biologist
Virginia E. Baughman (Stationed at Bombay Hook) . Refuge Clerk

The Prime Hook National Wildlife Refuge is administered through the
Bombay Hook National Wildlife Refuge, Smyrna, Delaware.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES & WILDLIFE
SUSSEX COUNTY, MILTON, DELAWARE

TABLE OF CONTENTS

GENERAL	1
WILDLIFE.	6
REFUGE DEVELOPMENT.	16
RESOURCE MANAGEMENT	20
FIELD INVESTIGATIONS.	21
PUBLIC RELATIONS.	22
OTHER ITEMS	30

NARRATIVE REPORT

PRIME HOOK NATIONAL WILDLIFE REFUGE

JANUARY - DECEMBER, 1971

I. GENERAL

A. Weather Conditions.

<u>Month</u>	<u>Precipitation</u> <u>Inches</u>		<u>Snowfall</u> <u>Inches</u>	<u>Temperatures</u>	
	<u>1971</u>	<u>Normal</u>		<u>Max.</u>	<u>Min.</u>
January	2.72	2.94	2	61	5
February	4.74	3.50		65	-5
March	2.57	4.34	1	73	21
April	2.54	3.29		75	27
May	4.97	2.93		83	38
June	2.10	4.14		90	50
July	4.71	5.74		96	52
August	5.93	5.11		90	51
September	3.53	3.69		88	49
October	5.55	4.13		83	40
November	2.87	3.72		79	25
December	<u>3.05</u>	<u>3.64</u>	<u> </u>	<u>70</u>	<u>18</u>
Totals:	45.28	47.17	3	Extremes: 96	-5

The above data were recorded at the Refuge weather station with the exception of the "normal" precipitation column which is based on U.S.D.C. Weather Bureau records for Lewes, Delaware, during the years 1954 through 1962.

This year's total snow precipitation was exceedingly low. No major storms occurred. January had two measurable snowfalls - one inch each; three "trace" recordings were made during the month. January 26 and 27 will be long remembered for the unusual weather conditions; all forms of precipitation seems to have occurred, i.e., rain (including an early morning thunderstorm), snow, sleet and hail fell on the 26th. The following day a near hurricane passed through with winds gusting to 70 m.p.h. No destruction was noted on the Refuge, whereas, extensive wind damage was recorded elsewhere throughout the county and State.

February's temperature extremes exceeded those recorded in the past six years. Two days of sub-zero temperatures hastened the partial freezing of the Delaware Bay. Precipitation occurred as rain except

for a snow-sleet-hail storm on the 4th, which accumulated a half-inch of slush.

The year's last measurable snowfall came on March 26; prior to that, three "trace" recordings were made for the month. A 73 degree reading was recorded on the 16th, bringing the daffodils and crocuses into full bloom, only to be checked by the subsequent snowfall.

A savage "Nor'easter" hit the Delmarva Peninsula on April 6 and 7. Winds gusted to 60 m.p.h.; tides ran three feet above normal; nearly two inches of rain fell, even scattered snow flurries were observed. The Delaware Bay broke through portions of the duneline at the southern end of the Broadkill Beach; no major intrusion, however, was made into the Refuge. The storm was followed by a three week period of no precipitation. A state-wide fire ban was in effect for the latter half of the month, the timing of which coincided with strong northwest winds that created severe dust storms; motorists, at times, were forced to curb their vehicles when caught in such squalls due to the zero visibility.

May's precipitation of nearly 5" was greatly appreciated. The temperatures for the month were quite cool: May 20 was the initial day and only time in the month that the mercury ascended past the 80° mark, whereas, last May recorded five 80+° days.

June was very dry. Frequent scattered thunderstorms formed throughout the county, but the Refuge was caught short on its share of precipitation. Two ninety-degree days were recorded.

July followed June's meager rainfall total and delivered only 1.45" by July 29. The monthly deficit was over 4". Corn crops were severely affected; stunted and dehydrated plants were commonplace. If, per chance, a farmer was spared the drought (as caused by sporadic, localized showers), he was most likely a victim of the southern corn leaf blight which thrives in humid/damp climes. The month ended on a very wet note: 3.26" of rain fell on the 30th. Water-levels recouped. Benefit to the stunted, partially corn-blighted cornfields was minimal since the crop's growth-potential period had already passed. July had six 90+° days.

Only 1.73" of rain fell between August 1 and 26; tropical depression Doria then drenched the drought-stricken area with 4.20" during the last week-end of the month.

Water tables remained high throughout the month of September. Farmers were severely hampered in harvesting their crops. The corn's moisture content percentages were high and the super-saturated croplands prohibited the use of harvesting equipment. Conditions for the anticipated waterfowl use were excellent.

October brought with it more rain; harvesting operations were again

hampered but from the viewpoint of the waterfowl hunter, conditions were optimum for blind accessibility by boat. Marshes and low-lying croplands were inundated increasing the water surface area from which the dabbling ducks would feed.

Though November's precipitation was below normal the water levels remained high because of the preceding two months' extreme rainfall. The first frost of the season occurred on November 5.

The first trace of snow was recorded December 18 -- quite a surprise since the previous day's high temperature reached an unprecedented 70 degrees. The month was exceptionally mild. The unseasonably warm temperatures initiated bud and flower development on the forsythias and other spring-flowering shrubs.

B. Habitat Conditions.

1. Water.

In essence, the Refuge does not, and will not, manipulate water levels via the construction of water-regulation facilities. Since the inception of the Refuge land-acquisition program the affected farmers were vociferous over any possible change in the water flowage pattern. It was envisioned that a direct inundation might occur on their tillable fields if a raised water table was permitted. The basis for such concern stemmed from misconceptions of what might happen to the low-lying lands if water retention facilities were erected. The people did not believe that by law, the Federal government could not hinder the drainage from private lands adjacent to the Refuge. The consensus was that some marshland would indiscriminately be flooded with little regard to subsequent side effects. People played on each others fears; they dramatized and politicized the issue to an extreme. It should be mentioned that the misunderstanding took place in the early 1960's -- at a time when the public believed that if they yelled loud enough the Refuge might go away. In an attempt to quell the row, a Regional Office memorandum was drafted in March 1965 and, in effect, assured the landowners that the land procurement was principally a marsh preservation project and there was no intention to develop the marshland. Some attribute the attainment of subsequent options to the aforementioned declaration, others contend that the pressure of impending condemnation was the persuader. The truth of the matter probably lies somewhere in between. Nonetheless, there is no water manipulation.

As in the past, water levels fluctuated in direct response to what might be sent from above. Water levels were adequate during the spring, fall, and winter. June, July and the majority of August were extremely dry.

TABLE I
PER CENT CROP UTILIZATION
January - April 1971

Refuge: Prime Hook

Crop	Acres	As of Dec. 31	Jan. 1-7	8-14	15-21	22-28	Feb. 29-4	5-18	March 19-4	5-18	April 19-1	2-15	16-30
Corn (cereal), stubble	327	85	--	-	-	-	90	95	100	100	100	100	100
Corn (cereal), standing	7	-	-	-	-	-	10	30	50	75	90	100	100
Buckwheat (cereal)	7	10	-	-	-	-	10	15	20	25	25	25	25
Millet (cereal)	4	10	-	-	-	-	10	15	20	25	25	25	25
Wheat (cereal)													
Soybean (cereal)													
(cereal)													
(cereal)													
Browse (wheat)	76	X	-	-	-	-	-	X	X	X	X	X	X
Browse (rye grass)	280	X	-	-	-	-	-	X	X	X	X	X	X
Browse (permanent grass)	271	X	X	X	X	X	X	X	X	X	X	X	X
Browse (Rye)	22	X	-	-	-	-	-	X	X	X	X	X	X
Browse ()													

Refuge: Prime Hook

TABLE II
PER CENT CROP UTILIZATION
October - December, 19 71

Crop	Acres	October				November				December				
		1-7	8-14	15-21	22-28	29-4	5-11	12-18	19-25	26-2	3-9	10-16	17-23	24-31
Corn (cereal), stubble	345	10	30	40	40	50	-	-	-	-	-	50	50	50
Corn (cereal), standing	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Buckwheat (cereal)	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Sorghum Millet (cereal)	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Wheat (cereal)														
Soybean (cereal)	48	-	-	-	-	-	-	-	-	-	-	-	-	-
(cereal)														
(cereal)														
Browse (wheat)	76	X	X	X	X	X	-	-	-	-	-	X	X	X
Browse (rye grass)	194	X	X	X	X	-	-	-	-	-	-	X	X	X
Browse (permanent grass)	144	X	X	X	X	-	-	-	-	-	-	X	X	X
Browse (Rye)	105	X	X	X	X	-	-	-	-	-	-	X	X	X
Browse ()														

2. Food and Cover.

An adequate supply of both natural and cultivated forage was present this year. The peak spring and fall goose:duck populations corresponded closely -- 4,600:2,000 and 5,000:1,800, respectively. The spring migrants gleaned the corn fields for the residual corn and cover crops. Several depredations calls occurred during mid-March. In response, a Zon exploder was dispatched; teleshot shells were also issued.

It was thought that the four acres of millet and seven acres of buckwheat would quickly be utilized by the spring migrants. Such was not the case. The only appreciable use received was from the blackbirds and meadowlarks. It is speculated that waterfowl use would have been good had there been standing water in both low-lying croplands; with that thought in mind, a late-summer planting of buckwheat and sorghum was made again. Although small puddles of water were evidenced in the fall, meager use followed. It is hoped that the dabblers will take notice of the fields chock full of seed on their return flight.

The wildlife pastures of Units II and IV were heavily used during the migratory months and served a dual purpose as being true refuges within the Refuge since hunting is restricted from both areas.

Due to the relative scarcity of geese this fall, approximately 50% of the corn fields went unused at year's end. The effects of browsing were virtually unseen.

II. WILDLIFE

A. Migratory Birds.

1. Waterfowl.

Canada Geese. Canada goose use was .57 million use days, a marked decrease from the record high one million use days in 1970. There was an increase in winter use, a slight reduction in spring use and a major drop in fall use when the peak population was only 5,000.

The autumnal population peaks for the past seven years have displayed a biennial cycle:

<u>Year</u>	<u>Population (Thousands)</u>
1965	8
1966	24.5
1967	2
1968	13
1969	5
1970	26.5
1971	5

The reasons for these population fluctuations are unknown and probably have no major significance. Food supply was certainly not a factor this year as waste corn and browse crops were abundant. During the winter the largest goose flocks browsed in barley fields outside the Refuge. In the spring the geese utilized the rye grass cover crop in Field 202 and the permanent grasslands in Units 2 and 4 with only minor use of croplands in Unit 3. Again in the autumn there was heavy grazing on grasslands in Units 2 and 4 but only light use of corn stubble and winter wheat fields in Unit 3.

Snow Geese. Spring snow goose use was light with a peak of only ten in mid-April. Fall migrant snow geese grazed on the pastures in Units 2 and 4, principally the latter, from late October to late December. The peak population was 140 in mid-November and the adult/young age ratio in this flock was 3:1.

Blue Goose. Blue geese were observed for the fifth consecutive autumn but there were only two observations, five birds on November 4 and a lone bird on December 17. A single bird was also seen on January 13.

White-fronted Goose. An adult white-fronted goose, the first Refuge record, was observed in a flock of 600 Canada geese in Unit 2 on April 5.

Whistling Swans. The first swans observed were a flock of seventeen migrating southward over headquarters on November 3. On many days from late November until the end of December from four to twenty-six swans rested in Unit 3 ponds and fed in nearby, off-Refuge corn stubble fields.

Ducks. Total duck use decreased approximately thirty percent compared with 1970 use, from 482 thousand to 322 thousand use days. This reduction followed two consecutive years of increased duck use and was attributable solely to the low spring population. Pintails and green-winged teal, which usually account for the majority of the spring use, were scarce with peaks of only 500 and 400, respectively. The population of black ducks and mallards was also low.

TABLE 3

CANADA GOOSE

STATUS OF MANAGEMENT OBJECTIVES AND ACTUAL USE

GOOSE USE DAYS			
	Objective Goals	Actual 1971 Use	Ratio Goal to Use
Spring (3/1-5/15)	400,000	160,320	1 to 0.4
Summer (5/16-8/31)	5,000	0	-
Fall (9/1-12/31)	530,000	278,350	1 to 0.5
Winter (1/1-2/28)	Min. (65,000)	129,750	1 to 2
Total	1,000,000	568,420	1 to 0.6

GOOSE PEAK POPULATION			
	Objective Peak	Actual 1971 Peak	Ratio Goal to Actual
Spring	-	4,600	-
Summer	-	0	-
Fall	12,000	5,000	1 to 0.4
Winter	-	3,500	-

Goose Production (not a primary objective) - None

TABLE 4

DUCKS

STATUS OF MANAGEMENT OBJECTIVES AND ACTUAL USE

	DUCK USE DAYS		
	Objective Goals	Actual 1971 Use	Ratio Goal to Use
Spring (3/1-5/15)	800,000	59,175	1 to .07
Summer (5/16-8/31)	400,000	88,255	1 to .2
Fall (9/1-12/31)	2,100,000	136,795	1 to .07
Winter (1/1-2/28)	200,000	37,780	1 to .2
Total	3,500,000	322,005	1 to .09

	DUCK PEAK POPULATIONS		
	Objective Peak	Actual 1971 Peak	Ratio Goal to Actual
Spring	20,000	1,720	1 to .09
Summer	-	1,035	-
Fall	30,000	1,740	1 to .06
Winter	-	1,875	-

	DUCK PRODUCTION		
	Objective	Actual 1971 Production	Ratio Goal to Actual
	3,000	760	1 to 0.3

TABLE 5

WATERFOWL DAYS OF USE PER ACRE OF WATERFOWL USE HABITAT

$$1. \frac{322,005}{\text{Duck Use Days, 1971}} \div 2. \frac{8,000}{\text{Acres of Duck Use Habitat}} = 3. \frac{40}{\text{Duck Use Per Acre of Waterfowl Habitat}}$$

$$1. \frac{568,420}{\text{Goose Use Days, 1971}} \div 2. \frac{8,000}{\text{Acres of Goose Use Habitat}} = 3. \frac{71}{\text{Goose Use Per Acre of Waterfowl Habitat}}$$

Duck production per wetland acre, 1971 - 0.11

Fall duck use continued at the low level of the previous four years with a peak of only 1,740. The green-winged teal was the most abundant species with a peak population of 1,000 in late October.

It was an excellent nesting season except that low pond levels during the early summer drought reduced the quality of brood habitat. Thirty-six duck broods were observed, the highest number since the 41 seen in 1968. The estimated production was 760 ducks with the black duck and blue-winged teal maintaining their status as the top two producers. However, the gadwall is gaining as the ten broods observed more than doubled the previous high of four in 1966.

Opportunities to observe production was greatest on Units 2 and 4 where the brood totals were 23 and 9, respectively. Black duck production was approximately equal on these two areas while the production of mallards, blue-winged teal and gadwalls were all higher on Unit 2. Bennett Pond in the northeast quarter of Unit 2 appears to be a concentration area for gadwall broods as seven broods with a total of 49 ducklings were observed there on July 22.

2. Shorebirds and Other Waterbirds.

Unit 4's habitat diversity, including the many shallow ponds, attracted the largest number and variety of shorebirds and long-legged waders. Receding water levels during the early summer drought provided good feeding conditions for shorebirds in July and early August. Numbers were only fair but the variety was excellent with seventeen species observed on August 17.

Heavy August precipitation flooded the ponds and late summer and early fall shorebird and wader use was generally poor. Two Wilson's phalaropes, one a female still in breeding plumage, were observed on a Unit 4 pond on July 22, the first record. The observation of two solitary sandpipers on September 4 was another new record.

Black-bellied plovers, pectoral sandpipers, killdeer and the rarer golden plovers foraged on the Unit 4 grasslands where a few migrant upland plovers were also noted. The buff-breasted sandpiper, a rare shorebird seen in only two previous years, was observed twice in September.

The observation of two black terns on September 4 added another new species to the Refuge avifauna.

3. Other Migratory Birds.

Mourning doves nested in the thickets, hedgerows and cedar groves and fed in the many cropped and fallow fields. The roosting population built up in the late summer and reached a peak of 1,500 during October.

The Unit 3 salt meadows adjacent to the Broadkill Beach Road have become a minor Mecca for birders desirous of hearing the nocturnal calling of the elusive black rail. Other rail species heard there one mid-May night were the Virginia, sora, clapper and king.

B. Upland Game Birds.

Ring-necked Pheasants. Consensus places the pheasant as a "non-renewable resource" for Sussex County because of the scarcity of free calcium in the soil. Hunting of the bird has been on a put-and-take system; cockbirds comprise the release. It has been the contention of this writer that, if properly protected the pheasant could establish and self-perpetuate itself. The alleged limiting factor of calcium is questioned; even if calcium is deficient in the edaphic environment. A suitable substitute of crushed clam shells might suffice. Mounds of shells are fairly common along streams and woods as were originally discarded by the Indians; farmers upturn and spread such mounds in their fields. Tertiary roadbeds are often topped with the bivalves. Sources of lime are present.....so are breeding pheasants. A brood was observed two or three times this year by James C. Wells, Jr. They were seen along the western boundary of the Refuge in Unit I. Mr. Wells claims that he has seen other broods in previous years.

A minimum population of 110 put-and-take cockbirds were present on the Refuge during the "Special Pheasant Hunt" in October. Several have been heard and seen subsequent to the hunt.

Bobwhite Quail. Approximately fifteen broods were noted on the Refuge this year. Six acres of wildlife pasture, adjacent to Headquarters, were unmanaged i.e., uncut. Multiflora rose has been the primary invader shrub. The quail and rabbit were quick to inhabit the altered habitat. The Refuge affords another 1,300 acres of suitable upland, marsh, and woodland edge habitat for the quail.

C. Big Game Animals.

Whitetail Deer. Small congregations of deer have frequently been seen both before and after the shotgun deer season. Groups numbering up to eleven have been seen at night in the corn fields along the entrance road.

Six fawns (including two sets of twins) were periodically observed throughout the summer months around the immediate Headquarters' area.

D. Fur Animals, Predators, Rodents and Other Animals.

Muskrats. The muskrat population continues to increase; trapping, however, has not been deemed a necessary management tool. To listen to the would-be trappers, the Refuge can hardly support another muskrat. Pelts are bringing an exceptionally high price: "blacks" - \$3.15, "browns" - \$2.00; the meat sells for \$.50. Little wonder we are "overrun with 'rats'".

Otter and Weasel. An otter family (consisting of five) was sighted November 8, in an unnamed pond where Blind #16 is located, within Unit 3. Their tracks, scats, and feeding platforms have been seen on several occasions; a skull was found on Tract 80. No weasel sightings were noted this year.

Fox, Raccoon, Opossum and Striped Skunk.

Mid-March produced at least two red fox pups, as evidenced by the sighting of two 4-5 week old foxes on Unit IV on April 13.

The first known raccoon parturition date occurred in mid-April. Their numbers appear moderate. The pre-season (waterfowl hunting) banding operation within Unit 4 attracted several marauding raccoons that claimed seven ducks. Four raccoons were dispatched at the trap site.

Opossums are numerous. Individuals, on occasion, display the effects of frostbite on their fleshy ears and naked tail. Young have been observed suckling in the pouch in early January after a short gestation period of 13 days.

Striped skunks are very common. An atypical albino skunk, adult male, was live-trapped in a No. 4 steel trap that was set for rats by Mr. James Reed (a life-time use reservationist) on November 20, within Unit IV. The Assistant Manager subsequently desecrated the mustelid and upon its natural death will donate same to the Smithsonian Institute.

E. Hawks, Eagles, Owls and Crows.

The raptor highlights of the year were the peregrine falcon sighted near headquarters on September 29, the first Refuge record, and the adult bald eagle seen over Unit 2 on December 1, the first noted since the only other observation in 1969. The more commonly observed species were the red-tailed, red-shouldered, rough-legged, sparrow and marsh hawks with the rough-legged present only during the winter.

Two of the three osprey nesting platforms erected in 1970 had activity this year. In early April four ospreys contended for occupancy of the Unit 4 platform but the nesting attempt by the victorious pair, after prolonged incubation, was unsuccessful. A second pair placed sticks on the Unit 2 platform but did not complete a nest.

The owls observed were the great-horned, barred, barn, screech and short-eared. The salt marshes and adjacent open grasslands are the wintering habitat of the short-eared owl. Eleven were counted in low flight or perched on posts from the Broadkill River to the Fowler Beach Road late in the afternoon of February 6.

F. Other Birds.

The Cape Henlopen-Prime Hook Christmas Count, which includes about 80% of the Refuge, tallied 129 species on December 19. This was the highest species total in the eight year history of the count, a result attributable to good area coverage and mild weather before and during the count. The most noteworthy observation was a small flock of glossy ibis.

Sixteen bluebird nesting boxes were erected in open habitat along hedgerows and fencelines and received good use by house wrens and tree swallows.

G. Fish. It appears that the fishing-public was not disappointed with the Refuge's fishing opportunities this year. Large mouth bass, chain pickerel and crappies were the angler's choice in the several ponds and Prime Hook Creek. The tidal Slaughter Creek and southern segment of Petersfield Ditch were extensively crabbed for the succulent blue crab.

Three anecdotes related to the denizens of the coastal waters are offered:

The yearly phenomena of the horseshoe crab spawning on the first new moon, closest to Memorial Day, occurred on May 24 this year; the beaches are subsequently littered with the stranded and often overturned crustacean.

In July, thousands of jellyfish, Cyanea capillata, invaded the Delaware Bay -- causing beachgoers to get more sun and less surf. Mr. Howard H. Seymour, Marine Extension Agent for the University of Delaware, offered the following explanations as to why the early influx of the tissue-like fish took place: (1) the unusually early warm water temperatures this year, and (2) the jellyfish, a normal inhabitant of inland salt water, may have been driven from their normal niche by the high salinity count as caused by

the lack of rainfall. The inland water salinity rose considerably -- from 5 - 10 ppt. to 10 - 16 ppt. (the jellyfish has a low salt content tolerance).

According to an August newspaper article, "fish kills" were reported at various locations along the Atlantic and Gulf Coasts. The aforementioned, Mr. Seymour, wrote that on August 2 he boated up the Broadkill River (Refuge's southernmost boundary) and viewed thousands of menhaden which had apparently been dead for several days; Seymour speculated that the fish died from suffocation due to the presence of blood on the gill covers. Investigation as to the cause of fish kills was to continue; no conclusions were known to have been subsequently reported.

H. Reptiles and Amphibians.

An Atlantic loggerhead sea turtle, weighing approximately 200 lbs., was found dead on the north end of Fowlers Beach this summer. A rope was tightly cinched around its plastron and carapace ...maybe a contributing factor to its demise.

In late May, a gray tree frog was spotted perched in a tree within the hedgerow bordering Tracts 54 and 79 (Unit 3).

Box turtles were frequently observed. The best time for their sighting was shortly after a rainfall as they would cross roadways which transected woodlands. A pair of box turtles was seen mating on July 15 on Tract 70f.

Mr. Eugene Moore was issued a snapping turtle trapping permit. He fiked twenty turtles, weighing a total of 181 lbs., from the waters of Unit 3.

I. Disease.

During the latter part of December, several dozen Canada geese displayed external symptoms of lead poisoning, i.e., general weakness, high-pitched call, stained vent, and emaciation. Five individuals were sacrificed from Unit 4 -- four geese displayed lead shot (1-7 pellets) in their gizzards. The malady has been noted on the Refuge since 1966. The disease reached endemic proportions in 1968.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

1. Real Property.

Sealed bids for the purchase and removal of a single, wood-frame house (R.P. #20) were opened October 29. The winning bid was in the amount of \$1,550.00 and was submitted by Mr. John R. McGee of Milton, Delaware. The house will be relocated adjacent to the Refuge's exterior boundary on State Road 236.

Renovated the dilapidated wrought-iron fence which encompasses the Morris Cemetery on Tract 54 via the removal of its sectionalized components for spot welding, straightening, painting, and the inclusion of a gateway.

2. Buildings.

a. Headquarters Area.

Two minor improvements were: (1) reparation of the east-facing side of the pump house (structural damage to R.P. #177 as caused by a flicker); and (2) painting of the Headquarters floor. Office alterations include the replacement of defective ballast transformer, modification of the gas burner's exterior flue, and a new lock for the entrance door.

b. Shop (R.P. #22).

Further improvements to the recently converted two-car garage included: (1) construction of two screens for windows; (2) painting of exterior; (3) buried a 110' extension of 1½" plastic tubing, from the existing waterline to the shop for the placement of an exterior spigot (the narrow-gauge ditching was performed by an informal contract); (4) affixed a 24' gutter, with downspout, to the west side of roof.

3. Fencing and Posting.

The following fence-footage was erected:

- (a) 300' of four-strand, barbed wire on grazing area No. 2, Unit 4 (a 12' aluminum gate was hung on same);
- (b) 100' of four-strand, barbed wire on grazing area No. 1, Unit 3; and
- (c) 70' extension to the existing four-strand, barbed wire fence on grazing area No. 3, Unit 4 (Jim's Pond).

All 1½" - 2" diameter pole-gates were repainted.

Routine replacement of defaced and stolen signs occurred as required. A routed 2' x 4' redwood sign, reading "Visitors Welcome Dawn to Dusk" on one side and "Come Again, Drive Carefully" on the back, was stolen (posts et al) during the night of March 1; it was replaced with a more expendable ½" plywood sign saying "No Entry After Dark". Two Smokey-the-Bear "Prevent Fire" signs were also stolen during the year.

4. Roads and Trails.

An interfield crossover was constructed over the ditchway that separates Fields 309 and 310 via the placement of a 18" x 24' corrugated metal pipe and approximately 30 cu. yds. of fill.

The sand-gravel interior roadways of Unit 3 were graded as required and one ton of calcium chloride was spread.

5. Waterways and Drainage Facilities.

In an attempt to lower the water table behind the Shop, 45 cu. yds. of sand-gravel was spread. Topsoil was subsequently hauled in and still awaits spreading due to the saturated substratum. A rechannelized ditch was dug to facilitate drainage on the east side of the Shop -- a low lying area that accumulates run-off from the adjacent field and roadway.

6. Maintenance and Equipment.

Routine 3,000 mile and 5,000 mile vehicular checks were maintained throughout the year. Specific repairs occurred as follows:

- (a) 1965 Chevrolet 4x4 Pickup: replaced one set of brake drums and had the other set turned, replaced all brake shoes; replaced two universal joints on the front drive, installed a new exhaust system; replaced three transfer case seals, replaced thermostat, replaced the front-end pinion oil seal, installed an anti-shimmy device on front-end, installed new speedometer, and mounted four new tires;
- (b) 1970 Chevrolet 4x2 Pickup: replaced door handle, mounted four new tires, installed P.C.V. valve and manifold gasket;
- (c) 1964 Dodge Dump Truck: mounted four new mud-grip tires and repaired a faulty brake fluid line;
- (d) JD-1010: painted tractor and its rotary mower, replaced fan blade and throttle leakage, installed new ignition switch kit, replaced rotary blades, and mounted a wooden swath board on its sickle-bar mower;
- (e) John Deere 3010: installed new water pump and radiator;

- (f) Tilt-top trailer: installed mud flaps, mounted eight new tires.
- (g) Johnson 3.5 h.p. outboard motor: replaced water pump;
- (h) Johnson 18 h.p. outboard motor: replaced points, plug, condensor and choke spring;
- (i) Boats and trailer: the 14' v-bottom Gruman boat, 12' Jon boat and boat trailer were repainted; repairs to the Gruman's faulty flotation were begun.

B. Plantings.

1. Aquatics and Marsh Plants. None.
2. Trees and Shrubs. None
3. Upland Herbaceous Plants.

Refuge personnel seeded the Cromwell Cemetery (Tract 80) with a red fescue/creeping red-fescue mixture subsequent to the clearing of shrubs and trees and the resloping of the ground with the D-4 dozer (see photos).

Purchased 10.5 tons of 10-10-10 fertilizer for application on 58 acres of wildlife pastures (Fields 311, 327 and 328). Actual application was limited to the spreading of three tons to 19 acres due to inaccessibility as caused by rain.

The following services were performed by the Refuge's five cooperative farmers:

	<u>Acres</u>
Sowing buckwheat/sorghum	12
Sowing browse wheat	76
Sowing browse rye (cover cropping)	105
Sowing Browse rye grass (cover cropping)	194
Liming (1 ton/acre)	179
Maintaining wildlife pasture (mowing)	144
Topdressing wildlife pasture	11

4. Cultivated Crops.

The Refuge cooperative farming program has been operational for six years. Five cooperative farmers tilled/maintained 614 acres in 1971 (331 acres of corn, 48 acres of soybeans). It was a year of weather extremes for the Delaware farmer: April's wind gusts sand-blasted many seedlings; drought hampered the crops' early growth during June and July; August's damp and humid weather was favorable for the establishment of the much-feared Southern corn leaf blight; tropical storm "Doria" caused extensive wind-damage to the corn fields; harvesting was off schedule (in some cases 2-3 months) because of the soggy fields.

Harvested yields on the Refuge were comparable to 1970's:
corn - 50 bushels/acre, soybeans - 5 bushels/acre.

Other harvested vegetation included:

<u>Vegetation</u>	<u>Acreage</u>	<u>Method</u>
Pasture Hay	2	Coop. Farming Agreement
Saltmarsh Hay	15	Special Use Permit
Alfalfa	11	Special Use Permit
Timothy-Clover Hay	15	Special Use Permit

In addition to the already mentioned services rendered by the cooperative farmer, in Section III.B.3 (Upland Herbaceous Plants), the following commitments were also met:

<u>Service</u>	<u>Acreage</u>
Fallowing Field 321	46
Standing Corn	5

C. Collections and Receipts.

1. Seeds and Other Propagules. None.
2. Specimens. Collected ten starlings in mid-November for a pesticide monitoring study per request of Mr. Alfred Godin, State Supervisor, Division of Wildlife Services, Trenton, New Jersey.

D. Control of Vegetation.

Johnsongrass. An extensive chemical/mechanical Johnsongrass control program was made for Field 321 -- a 46-acre parcel of land wherein the insidious weed abounds. Past control practices did not seem to have any retardant effect. Complete eradication would be most welcomed but is not realistic due to the plant's extreme stamina and its viable seed. In an attempt to at least contain and control the weed, two plowings, four discings, and a mid-summer spraying of Dalapon was made.

The spraying was at a rate of 6-8 lbs./50 gals. of water; a total of 140 lbs. was applied to Field 321. The plants never attained a height over 8" before they were either plowed or disced under. Timing of mechanical control is most important: the young shoot is dependent upon the rhizoms for sustenance and cannot manufacture its own food until 6" - 8" high. A basic step in control is to reduce the level of stored food or energy. This will weaken the plant and make it susceptible to a "knock-out punch" delivered by a toxic chemical or cultural practice. Results appear promising -- no noticeable spreading occurred. Future control will take the

form of periodic mowing subsequent to the spring sowing of a wildlife-pasture seed mixture.

Fields 301, 312, 313, 314 and 318 had spot infestations of Johnsongrass. Hand-pulling and chemical spraying helped to control this weed.

Purple Loosestrife. The infestation of purple loosestrife was surveyed again this year to determine current distribution and effectiveness of the 1970 chemical spray program. There was a significant reduction in the area occupied by purple loosestrife in Unit 2, a decrease attributed solely to the success of the ammonium sulfamate (Ammate X) spray used last year. Only a few flowering loosestrife plants were found in the large sprayed stands and these probably did not receive a sufficient spray dosage. Most of last year's plants appeared completely dead above ground but there were short, vegetative shoots from the root systems. Control, therefore, may be only temporary, for one or two growing seasons. A water solution of ammonium sulfamate was used again this year to control small patches of loosestrife in Units 1 and 2 and many scattered individual plants in Unit 2 were pulled up by hand.

Spiny Pigweed and Thistle. As noted in previous narratives, Unit 4 contains both perennials within the grazing areas. Since the land is still in litigation, no chemical control proposals will be prescribed until the government has clear title. Mowing was performed by both Refuge personnel and labor volunteered by the grazing permittee. Approximately 100 acres of infested land were mowed.

E. Planned Burning. None.

F. Fires. None.

IV. RESOURCE MANAGEMENT

A. Grazing.

Two individuals were again issued special use permits for the grazing of their cattle during the non-conflicting (waterfowl-use versus cattle-use) months of May through October. This six-month management tool has aided in maintaining open, non-brushy fields for goose grazing during the other six-month period. A total of 360 acres is open to grazing. Pertinent statistics are as follows:

<u>Permittee</u>	<u>Tract(s)</u>	<u>Acreage</u>
J. Howard Isaacs	12	138
Island Farms, Incorporated	79 & 79c	222

A conservative carrying capacity limit as determined, in part, by the Soil Conservation Service Agronomist, has been set and adhered to by both permittees. A total of 1,441 Animal Unit Months grossed \$2,053.00.

B. Haying.

A special use permit issued to J. Howard Isaacs for cutting up to 25 acres of marsh hay @ \$2.00/acre for the third year. Fifteen acres were cut.

Another special use permit was prepared for J. Nailor Wells, a cooperative farmer, to cut and remove alfalfa from Field 204 which contains 11 acres. The cutting right cost \$25.00/acre; \$275.00 was realized.

Cooperative farmer, Howard West, harvested two acres of pasture hay from Field 308 as a portion of his refuge farming agreement.

C. Fur Harvest. None.

D. Timber Removal. None.

E. Commercial Fishing. None.

F. Other Uses. None.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Banding Program.

Ducks. Trapping began on August 16 and terminated October 15. A single, walk-in, chicken-wire meshed, angle-iron framed, 9' x 8' x 5' trap captured the following:

<u>Species</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>
	<u>HY</u>	<u>AHY</u>	<u>HY</u>	<u>AHY</u>	
Blue-winged teal	22	7	26	21	76
Black	23	4	38	5	70
Green-winged teal	9	5	9	10	33
Pintail	1	1	8	4	14
Total					193

The trap site was on the edge of "Trap Pond", located within Unit 4.

B. Research. None.

VI. PUBLIC RELATIONS

A. Recreation.

The following figures portray 1971's annual recreational use:

1. Consumptive public use:

<u>Activity</u>	<u>No. Participants</u>
Hunting:	
Big Game	550
Upland Game	1,455
Waterfowl	1,461
Bow	105
Fishing:	
Salt Water	2,930
Warm Water	1,510
Fruit, Nut and Vegetation Collection	60

2. Non-consumptive public use:

<u>Activity</u>	<u>No. Participants</u>
Fox Chase	50
Wildlife Photography	85
Wildlife Observation	3,250
Wildlife Tours/Routes	50
Visitor Contact Stations	2,590
Off-site Programs	86
On-site Programs	3
Boating	435
Picnicking	245
Horseback Riding	70
Bicycling	95
Winter Sports (Skating)	10

The above breakdown of consumptive vs. non-consumptive activities can be misleading; the activities are non-additive items due to the fact that a single participant may engage in several activities during a single visit.

Actual visits for the year approximate 8,350.

B. Refuge Visitors.

<u>Date</u>	<u>Name</u>	<u>Organization</u>	<u>Purpose</u>
1/12	William Ireland	Soil Conservation Service	Soil-type mapping
1/28	Nell Prior	Blackwater NWR	Visit/tour
"	M. Lankes	"	"
1/28	S. Chaiyapun	Thailand - Forestry Dept.	Visit/tour
2/12	Arthur Pittard	State Highway Dept.	Right-of-way
3/2	Louis Rickards	State Police	Theft Invest.
3/25	Bernard Meltzer	Meltzer, Inc., Phila., Pa.	Appraisal
3/25	William Yetke	"	"
"	Richard Cohen	"	"
4/8	William Yetke	"	"
5/5	Louis Catalanotto	R.O., Division of Realty	"
5/5	Herman Kitchen	Unit I, Film Prod., Inc. New York, New York	Visit
5/6	Howard Woon	Reg. Refuge Supervisor, R.O., Boston, Mass.	Visit/tour
5/31	R. W. Peterson	Governor of Delaware	Visit
6/7	Richard Bosche	N.J. Audubon Society	Visit
6/16-17	Donald Bredermitz	R.O., Division of Realty	Land Acquisition
"	John Murray	"	"
6/16	Linda Kipp	R.O., Division of Refuges	Visit/tour
6/24	Charles Mohr	Del. Chief Park Nat'lst	Terrapin study
6/24	Richard Goerger	State Entomologist	Johnsongrass Control
7/9	William Tucker	Morton NWR	Visit
"	George O'Shea	Target Rock NWR	Visit
"	Anthony Morich	Target Rock NWR	Visit
7/23	Louis Catalanotto	R.O., Division of Realty	Appraisal
7/30	Randel Baird	U.S.C. & G.S.	Bay erosion study
7/30	Robert Porter	Mouport Advert. Agency Fairfax, Virginia	Broadkill Beach Dev. Brochure
8/2	Randel Baird	U.S.C. & G.S.	Bay erosion study
8/5	Robert Porter	Mouport Advert. Agency	Broadkill Beach Dev. Brochure
9/9	Jess Grove	C.O., Interp. Specialist	Visit/tour
9/13-16	Donald Bredermitz	R.O., Division of Realty	Land Acquisition
9/14	David Janes	R.O., Division of Realty	"
10/5	Roger Tornstrom	R.O., Division of Engrg.	Survey
10/18			
& 19	William Ashe	C.O., Division of Realty	Appraisal
10/18			
& 19	Louis Catalanotto	R.O., Division of Realty	"

11/8-			
11/11	Donald Bredernitz	R.O., Division of Realty	Land Acquisition
"	David Janes	"	"
11/11	Alfred Godin	Division of Wildlife Services, Trenton, N.J.	Pesticide Monitoring Study
12/13-			
16	David Janes	R.O., Division of Realty	Appraisal

The Refuge was frequently visited by several Environmental Protection Officers and Wildlife Managers of Delaware's Natural Resources and Environmental Control Agency.

Visitors from Canada, France, Holland, Thailand and Australia stopped by the Office.

C. Refuge Participation.

The Assistant Manager served as a Committee Member, Assistant Scoutmaster, and Merit Badge Counselor for Boy Scout Troop 198, Milton, Delaware.

Major items of Refuge participation were:

- 1/9: Assistant Manager Nugent attended the "Project SOAR" (Save Our American Resources) conservation clinic representing Troop 198 of Milton, Delaware. The seminar was held at the University of Delaware Agricultural Sub-station, Georgetown, Delaware.
- 2/9: Assistant Manager Nugent and Maintenanceman Clifton attended the Smith-Douglas Fertilizer's (Division of Borden, Inc.) annual dinner/new product-presentation program, Seaford, Delaware.
- 3/19: Mr. Nugent attended the Sussex District Annual Boy Scout Leader's Banquet, Georgetown, Delaware.
- 3/26: Assistant Manager Nugent attended the Senate Public Works Sub-committee on Air and Water Pollution; it held its public hearing on the ocean dumping controversy at the Rehoboth Beach Convention Hall, Rehoboth, Delaware.
- 4/14: Assistant Manager Nugent attended a seminar on the detection and control of the Southern pine beetle and gypsy moth at the University of Delaware Sub-station, Georgetown, Delaware.
- 4/19: Assistant Manager Nugent presented an Earth Week Program to Troop 198, Milton, Delaware.

- 5/28: Assistant Manager Nugent attended Milton's Lions Club dinner, Milton, Delaware.
- 6/21: Assistant Manager Nugent and Maintenanceman Clifton testified in Dover's Federal Court re a 1970-71 waterfowl hunting season violation on Refuge.
- 8/12: Assistant Manager Nugent met with State Fish and Wildlife Division personnel (Department of Natural Resources and Environmental Control) to discuss proposed operations and responsibilities of the upcoming 1971-72 cooperative Federal-State waterfowl hunting program and the State sponsored "Special Pheasant Season" which the Refuge will host again this year.
- 11/1: Assistant Manager Nugent presented a talk and showed film, So Little Time, to the members of the Teals Point Sportsmen Club, Milford, Delaware.

- D. Hunting. This year marked the fifth annual Federal-State Waterfowl Hunting Program at Prime Hook. A Federal part-time laborer was again hired to man the waterfowl check station during the peak-use period: from 2½ hours before sunrise until 1½ hour thereafter.

Maintenance of the eight State-owned blinds and eighteen Federally-owned blinds was jointly performed by the two agencies. An air boat (loaned by the Brigantine National Wildlife Refuge, Oceanville, New Jersey) provided quick and easy access for October's grassing operation.

Issuance of Refuge permits was continued on a first-come, first-served basis. The State Division of Fish and Wildlife modified the permit issuance system on its two areas hunted for waterfowl, i.e., Woodland Beach Wildlife Area and Little Creek Wildlife Area. The State has converted to a lottery system; whereby a drawing is made approximately two hours prior to the legal shooting time. The main advantage is that everyone has an equal chance of being selected and no extensive waiting is involved. Drawings are held every morning when more than one hunting party is involved. At first glance, it would appear unnecessary to go through the mechanics of a lottery when only several parties are present and 15-21 blinds are available. Answer: a few blinds within each area are highly favored because of past hunting results and tend to become monopolized (as was proven with the "first-come, first-served" system).

If the State's new system seem equitable, why doesn't the Refuge follow suit? Two reasons: First, hunting at Prime Hook differs from the State areas; the Refuge's blinds are located in non-tidal areas. No daily flyway patterns are present as evidenced in the State's tidal areas. Statistics show that hunting success on the Refuge is due, largely, to hunting pressure and fate -- not to blind location as is the State's case. Second, the Refuge's

permit issuance system provides an alternative to the State's system....an obvious fact but most important. Some hunters do not mind waiting in line; in fact, during the five short years of the Refuge's waterfowl hunting program, the waiting has become accepted and in many cases enjoyed. Unbelievable? Maybe; but many of the local and not-so-local hunters have made a social gathering from an otherwise monotonous event. Lively conversations are struck, pregnant with high expectations of the upcoming hunting seasons coupled with much reminiscence over past years' hunts. Many vacation schedules center around "openin' day for duckin'". The first twenty-six hunting parties to put their names on the sign-up sheet are virtually guaranteed a blind. This year a camper/hunter signed in 54 hours in advance! If a hunter cannot afford such a wait, he now has an alternative -- show up two hours before legal shooting time at a State area.

Hunting results from the 1971-72 Waterfowl Hunting Season were extremely close to the previous year's. The inclusive dates for the State's split-season were: first half - ducks and Canada geese - October 30 through November 27; second half - ducks - December 11 through December 31 and Canada geese - December 11, 1971 through January 20, 1972.

The duck season ran its scheduled duration but the goose season was prematurely terminated from the eighteen Federally-owned blinds on December 31, 1971 due to the species low bag number. The State's eight blinds remained open until January 20, 1972 -- no hunting permits were required subsequent to December 31; hunting, in effect, terminated at year's end with only several parties hunting from the State blinds.

Comparative hunting statistics are offered:

<u>Ducks Bagged</u>							
<u>Hunt.Yrs.</u>	<u>Total No. Hunter Days</u>	<u>G.W. Teal</u>	<u>Black</u>	<u>Mallard</u>	<u>Misc. Ducks</u>	<u>Geese Bagged</u>	<u>Total Bag</u>
1967-68	803	139	50	44	98	11	342
1968-69	1,167	230	120	57	55	87	531
1969-70	1,105	250	122	73	153	39	637
1970-71	1,472	287	133	89	122	209	840
1971-72	1,521	334	108	80	266	66	854

A tally was kept on the hunting success from each individual blind as based on total hunter usage. Blind-usage varied in proportion to blind-accessibility and personal preference. It ranged from 10 man-days for Blind #27 to 117 for Blind #16. Average bag was .56 birds (ducks/geese)/hunter; extreme bags, based on individual blinds, varied between zero (Blind #27) and 1.08 birds/hunter (Blind #25).

2. Big Game.

Sussex County's eight-day shotgun deer season was considered most successful with a reported kill of 384 deer -- a significant increase from the 1970 total of 268. The State's three county total was unprecedented 1,064 -- 122 more than last year's record kill.

The Refuge contributed approximately a dozen whitetails to the tally; the exact number not certain since there is no check station on the Refuge. Refuge-killed deer may be checked in at any one of four State Police Stations where State Wildlife Division personnel are situated to collect the vital statistics. The confidence level of exacting the location for specific deer kills is quite low since many of the hunters are unfamiliar with the areas of their hunt and others are reluctant to disclose their favored hunting haunts. So with that premise, the figure of twelve is offered as the Refuge deer kill for 1971. Another twenty deer were taken within close proximity to the boundary (2-3 miles).

3. Upland Game.

The third annual State-sponsored, Refuge-hosted "Special Pheasant Hunt" was held from October 9 through the 16th. A total of 110 pen-reared cockbirds were released on two separate occasions. Hunting pressure totalled 292 hunting days; the aggregate bag totalled 78 birds with another 15 being reported as "crippled".

Other upland game hunted were quail, rabbit, squirrel, and red fox (chase only). Success was good with the rabbit. Many hunters bagged their limit of four with little effort. The sedentary squirrel hunter was often disrupted by the mobile rabbit hunter and his dogs -- a near unresolvable conflict since the two types of hunting are frequently done by the same hunter but at different times.

E. Violations.




Eight verbal warnings were issued during the year for a variety of minor infractions.

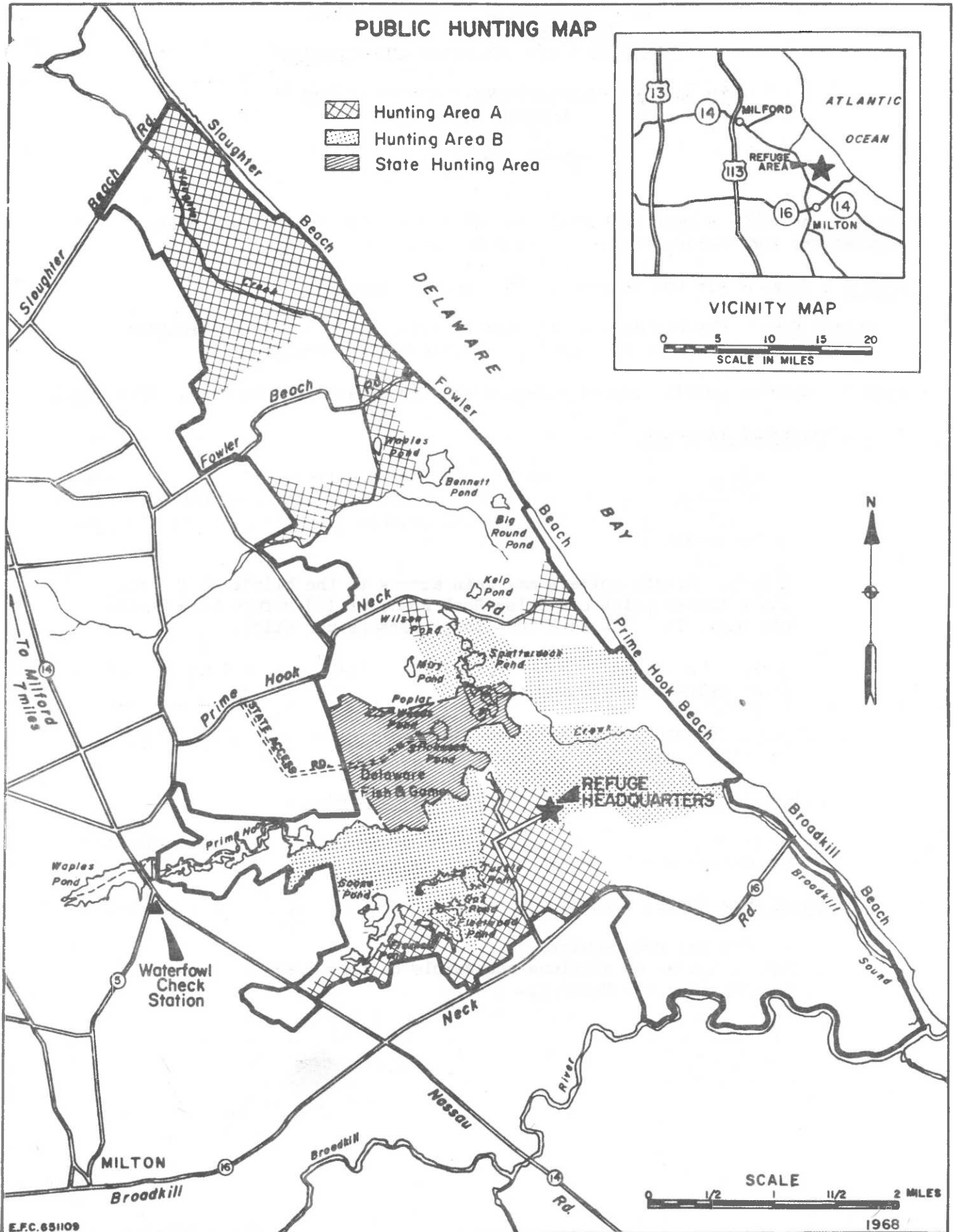
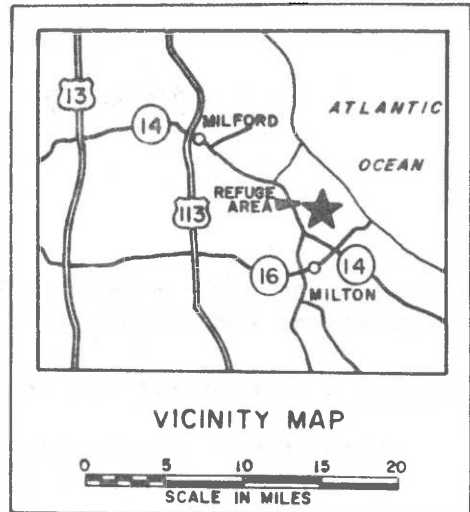
A follow-up account is given re the eleven apprehensions that were made on the opening day of the 1970-71 waterfowl hunting season. The violations included taking and attempting to take waterfowl in a closed area to waterfowl hunting; driving of vehicles on undesignated areas; an unplugged gun; and illegal entry into the waterfowl hunting area via intentional circumvention of the check station rules and regulations.

PRIME HOOK NATIONAL WILDLIFE REFUGE
SUSSEX COUNTY, DELAWARE

28.

PUBLIC HUNTING MAP

-  Hunting Area A
-  Hunting Area B
-  State Hunting Area



U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

PRIME HOOK NATIONAL WILDLIFE REFUGE
MILTON, DELAWARE

PUBLIC HUNTING AREAS

These areas will be open to hunting in accordance with Federal and State regulations and special conditions listed below.

AREA A. Permits are not required. (See map on reverse.)

Upland Game. The hunting of only white-tailed deer, cottontail rabbits, squirrel, raccoon, red fox, quail, and pheasant is permitted.

AREA B. Special permits are required except for upland game hunting. (See map.)

1. Waterfowl and coot.

Permits. Issued from two hours before sunrise until 3:00 p.m. each hunting day at the checking station at intersection of Routes 5 and 14. All persons must check out at the checking station prior to one hour after sunset.

Blinds. Permit holders may gain access to the blinds at (1) the State access point off Prime Hook Road, or (2) refuge headquarters off Route 16. Not more than three persons per blind.

Boats. Necessary to reach all blinds. Small outboard motors and stout poles are recommended.

Guns. Possession of a loaded gun outside a blind while hunting migratory game birds is prohibited.

2. Rail, gallinule, mourning dove, woodcock, and snipe.

By permit only. (Same restrictions as waterfowl hunting.) Hunting prohibited until opening of waterfowl season.

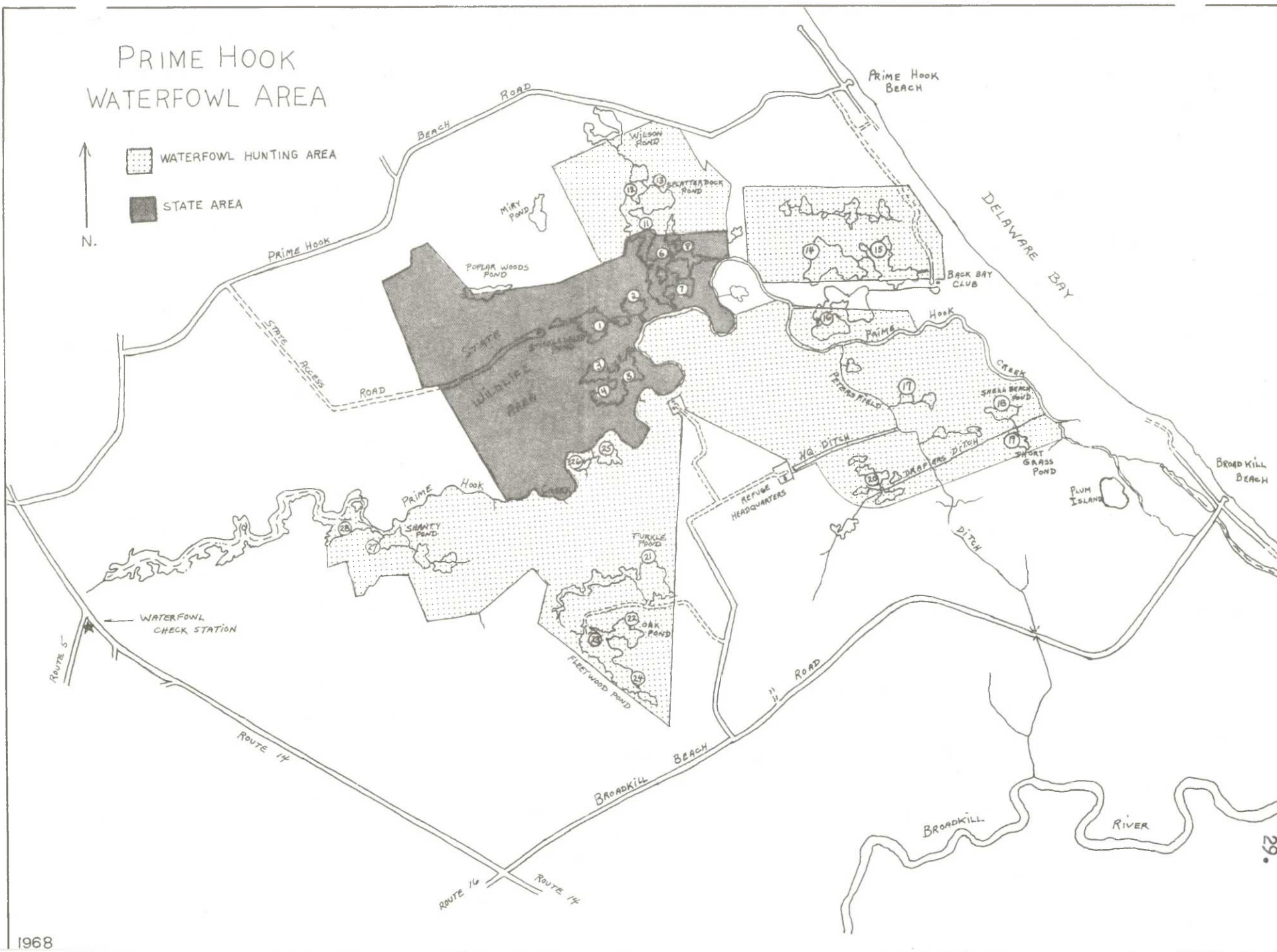
3. Upland Game (deer, rabbit, squirrel, raccoon, red fox, quail, and pheasant).

Permits are not required.

May be hunted on sections accessible by foot travel.

No hunting after March 31.

PRIME HOOK WATERFOWL AREA



Final disposition for seven of the violators took the form of a letter-of-reprimand as issued by Delaware's U. S. Game Management Agent. It was thought that if more conspicuous no-hunting signs had been posted, some infractions might have been deterred. The posting was improved.

The four individuals who illegally entered the waterfowl hunting area were notified to appear in Federal Court; if no contest was to be made, a \$35.00 fine could be paid by mail, in lieu of court appearance. One defendant elected to pay via mail. The other three contested and won their case on grounds of insufficient instructions for the self-service permit issuance procedure at the Check Station. It is believed that the individual who paid by mail was reimbursed his fine and also found not guilty. Instructions at the Check Station were further elucidated.

F. Safety.

Monthly safety meetings were conducted throughout the year, either at Prime Hook or in coordination with Bombay Hook's safety meetings. The Refuge maintains its unblemished Safety Record of 2,403 days without a lost-time accident.

VII. OTHER ITEMS

A. Items of Interest.

1. Training.

Maintenanceman William Sipple attended a Civil Defense Update Seminar on May 13, Georgetown, Delaware.

Assistant Manager Richard Nugent attended a Refuge Systems Workshop, October 5 - 8, Boston, Massachusetts.

2. Revenue Sharing Act.

Assistant Manager Nugent presented the Sussex County Council the 1971 Refuge Revenue Sharing Act check in the amount of \$13,640.73 on November 2, 1971.

3. Credits.

Wildlife Biologist Norman E. Holgersen prepared Sections II.A.1-3, II.E., II.F., Tables 2 - 5, and NR forms 1 - 4 and 12. Assistant Manager Richard Nugent prepared the remainder of the text and NR forms and assembled the report. Refuge Manager Thomas J. McAndrews edited the entire report. Refuge Clerk Virginia E. Baughman typed the report in its entirety.

- B. Narrative Report Forms. Appended.
- C. News Articles. Appended.
- D. Photographs. Appended.

Reviewed by:

Submitted by:

Howard D. Wood
Regional Refuge Supervisor

Thomas J. McAndrews

Date: _____

Date: 4-20-72NR's Checked in R.O. by HC

W A T E R F O W L

REFUGE Prime Hook

MONTHS OF January TO April, 1971

(1) Species	(2) Feb. Weeks of reporting period									
	Jan. 1 - 7	8 - 14	15 - 21	22 - 28	29 - 4	5 - 11	12 - 18	19 - 25	26 - 4	5 - 11
	1	2	3	4	5	6	7	8	9	Aerial
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	2,500	250	2,000	2,000	1,500	2,500	3,500	3,000	3,000	4,600
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	30	10	10	10	10	25	45	175	200	65
Black	150	75	75	75	100	150	175	450	575	400
Gadwall								15	10	10
Baldpate								20	20	
Pintail	5					1,700	200	700	500	75
Green-winged teal								350	400	100
Blue-winged teal								5	5	10
Cinnamon teal										
Shoveler									10	25
Wood										10
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead								100		
Ruddy										
Other										
Coot:									5	5
NR-1 From <u>January</u> to <u>April</u> , 19 <u>71</u>										

3 -1750a

Cont. A 1
(Rev. March 1953)WATERFOWL
(Continuation Sheet)REFUGE Prime HookMONTHS OF January TO April, 19 71

(1) Species	(2) Weeks of April Reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total	
	March 12-18 11	19-25 12 Aerial	26-1 13	2-8 14	9-15 15	16-22 16	23-29 17	30 18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	4,000	3,000	3,000	2,000	2,000	1,500	700	700	289,650		
Cackling											
Brant											
White-fronted											
Snow	5	5	5	5	10	5	5	5	285		
Blue											
Other											
Ducks:											
Mallard	25	25	25	25	25	25	25	25	5,310		
Black	300	230	200	150	150	150	150	150	25,035		
Gadwall	50	225	150	100	100	50	50	50	5,370		
Baldpate			50	50	20	10	10	10	1,270		
Pintail	50	50	10		5	5			23,100		
Green-winged teal	100	100	200	200	200	200	100	100	14,450		
Blue-winged teal	50	125	200	200	200	200	200	200	8,565		
Cinnamon teal											
Shoveler	85	35	50	50	50	25	30	30	2,550		
Wood	25	50	50	50	50	50	50	50	2,395		
Redhead											
Ring-necked			25	15	25				455		
Canvasback											
Scaup											
Goldeneye											
Bufflehead		5			10				805		
Ruddy											
Other											
Coot:			5	5	5				175		
					(over)						

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	:	:	:
Geese	289,935	4,600	:
Ducks	89,305	1,875	:
Coots	175	5	:

SUMMARY

Principal feeding areas Geese: Units 2 and 4

Ducks: Units 2 and 3

Principal nesting areas _____

Reported by N. Holgersen

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.

1953

5 11/66

W A T E R F O W L

REFUGE Prime Hook

MONTHS OF May TO August, 19 71

(1) Species	(2) <u>June</u> : May Weeks of reporting period July									
	: 1 - 7	: 8 - 14	: 15 - 21	: 22 - 28	: 29 - 4	: 5 - 11	: 12 - 18	: 19 - 25	: 26 - 2	: 3 - 9
	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	50	10								
Cackling										
Brant										
White-fronted										
Snow	10									
Blue										
Other										
Ducks:										
Mallard	25	25	25	25	25	25	50	50	75	75
Black	150	150	150	150	150	150	200	250	250	250
Gadwall	50	50	50	50	50	50	50	75	75	75
Baldpate	10									
Pintail										
Green-winged teal	50								5	5
Blue-winged teal	200	200	200	200	200	200	250	300	350	350
Cinnamon teal										
Shoveler	15									
Wood	50	50	50	50	50	50	100	100	150	150
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										

NR-1 From May to August, 19 71

3 -1750-

Cont. No. 1
(Rev. March 1953)WATERFOWL
(Continuation Sheet)

REFUGE

Prime Hook

MONTHS OF May TO August, 19 71

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total	
	: July 10-16	: 17-23	: 24-30	: 31 - 6	: 7 - 13	: 14 - 20	: 21-27	: 28-31			
Swans:	11	12	13	14	15	16	17	18			
Whistling											
Trumpeter											
Geese:											
Canada									420		
Cackling											
Brant											
White-fronted											
Snow									70		
Blue											
Other											
Ducks:											
Mallard	75	75	100	100	100	100	100	100	7,750	5	70
Black	250	250	250	250	250	250	250	250	26,200	14	270
Gadwall	75	75	125	125	125	125	125	125	9,950	10	120
Baldpate									70		
Pintail											
Green-winged teal	5	5	10	10	50	50	50	50	1,880		
Blue-winged teal	350	350	350	350	300	300	300	300	34,450	7	240
Cinnamon teal											
Shoveler									105		
Wood	150	150	200	200	200	200	200	200	15,500	0	60
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	---	---	---
Geese	490	60	---
Ducks	95,905	1,035	760
Coots	---	---	---

SUMMARY

Principal feeding areas Units 2 and 3

Principal nesting areas Units 2 and 3

Reported by Norman E. Holgersten

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.

1953

5 11/66

W A T E R F O W L

REFUGE Prime Hook

MONTHS OF September TO December, 1971

(1) Species	Weeks of reporting period									
	: Sept.		(2) Oct.						Nov.	
	: 1 - 7	: 8 - 14	: 15 - 21	: 22 - 28	: 29 - 5	: 6 - 12	: 13 - 19	: 20 - 26	: 27 - 2	: 3 - 9
	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	-	-	-	50	500	1,000	4,000	3,000	3,000	5,000
Cackling										
Brant										
White-fronted										
Snow									70	40
Blue										5
Other										
Ducks:										
Mallard	75	75	75	50	50	50	50	50	50	50
Black	200	200	200	200	250	300	350	350	350	350
Gadwall	100	100	50	25	25	10	10	10	10	10
Baldpate			5	5	10	10	10	10	15	15
Pintail			10	25	25	50	100	100	100	50
Green-winged teal	100	100	150	500	800	800	800	1,000	1,000	700
Blue-winged teal	300	300	200	150	100	50	50			
Cinnamon teal										
Shoveler							25	15	10	10
Wood	200	200	200	200	200	200	200	200	100	50
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead									5	5
Ruddy							5	5	5	5
Other										
Coot:							5	5	15	50

NR-1 From September to December 1971

WATERFOWL
(Continuation Sheet)

MONTHS OF **September** TO **December** , 19 **71**

(1) Species	Dec. (2) Weeks of reporting period								(3) Estimated	(4) Production	
	Nov. 10 - 16	17 - 23	24 - 30	1 - 7	8 - 14	15 - 21	22 - 28	29 - 31	waterfowl	Broods	Estimated
	11	12	13	14	15	16	17	18	days use	seen	Total
Swans:					5	10	5	5	155		
Whistling											
Trumpeter											
Geese:											
Canada	4,000	3,000	3,000	2,500	2,500	2,500	4,000	4,000	278,350		
Cackling											
Brant											
White-fronted											
Snow	140	85	85	100	110	110	5	5	5,230		
Blue									35		
Other											
Ducks:											
Mallard	75	75	75	75	75	75	100	100	8,175		
Black	400	400	400	400	400	300	450	450	39,850		
Gadwall	25	25	25	25	10				3,220		
Baldpate	50	50	50	25	25	5			1,995		
Pintail	100	100	100	25	25	25	25	25	6,095		
GW teal	400	400	400	200	50	50	200	200	54,150		
BW teal									8,050		
Cinnamon teal											
Shoveler	40	40	40	30	25	15			1,750		
Wood	50	25	25						12,950		
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead									70		
Ruddy	10	10	10	10	5	5			490		
Other											
Coot:	15	10	10	10					840		
					(over)	NR-1	Cont. From	September	to	December	19 71

	(5)	:	(6)	:	(7)
	Total Days Use	:	Peak Number	:	Total Production
Swans	155	:	10	:	
Geese	283,615	:	5,045	:	
Ducks	136,795	:	1,740	:	
Coots	840	:	50	:	

SUMMARY	
Principal feeding areas	Unit 4
Principal nesting areas	
Reported by	N. Holgersen

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

- (1) Species: In addition to the birds listed on form, other species occurring on the refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Prime Hook

Months of January to April 19 71

(1)	(2)		(3)		(4)		(5)			(6)
Species	First Seen		Peak Concentration		Last Seen		Production			Total
Common Name	Number	Date	Number	Inclu- sive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Horned Grebe	1	3/29	1	3/29-4/9	1	4/9				12
Pied-billed Grebe	Previous Period		25	3/15-4/30	Still Present					1,200
Great Blue Heron	Previous Period		10	3/15-4/30	Still Present					700
Green Heron	1	4/20	10	4/26-30	Still Present					60
Little Blue Heron	1	4/20	1	4/20	1	4/20				1
Cattle Egret	1	3/29	1	3/29	1	3/29				1
Snowy Egret	1	4/5	12	4/20	Still Present					50
Black-crowned night heron	Previous Period		20	3/25-4/30	Still Present					800
American Bittern	Previous Period		75	4/15-30	Still Present					1,500
Glossy Ibis	1	3/7	55	4/20	Still Present					850
King Rail	Previous Period		50	4/15-30	Still Present					800
Clapper Rail	Previous Period		200	4/1-30	Still Present					6,500
Virginia Rail	Previous Period		50	4/15-30	Still Present					800
Common Gallinule	1	4/5	5	4/15-30	Still Present					75
II. Shorebirds, Gulls and Terns:										
Killdeer	Previous Period		50	3/25-4/7	Still Present					1,000
American Golden Plover	10	4/20	10	4/20	10	4/20				10
Black-bellied Plover	Previous Period		5	3/29-4/30	Still Present					175
Ruddy Turnstone	Previous Period		60	3/29-4/5	Still Present					600
American Woodcock	Previous Period		150	3/15-21	Still Present					4,500
Common Snipe	Previous Period		300	3/15-31	Still Present					7,000
Willet	50	4/12	100	4/15-30	Still Present					1,500
Greater Yellowlegs	1	3/29	20	4/10-30	Still Present					450
Lesser Yellowlegs	5	4/9	5	4/9-30	Still Present					100
Pectoral Sandpiper	2	4/20	5	4/21-30	Still Present					50
Least Sandpiper	5	4/26	5	4/26-30	Still Present					25
Dunlin	Previous Period		10	4/1-30	Still Present					350

(over)

NR-1A From January to April 19 71

5RF-2/71

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove						
White-winged dove						
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow						
Red-tailed Hawk	Previous Period	8	1/1-4/30	Still Present		1,000
Red-shouldered Hawk	Previous Period	6	3/1-4/30	Still Present		375
Rough-legged Hawk	Previous Period	10	1/15-3/1	1	3/25	600
Marsh Hawk	Previous Period	35	1/1-2/15	Still Present		2,000
Osprey	1 3/13	4	3/21-4/30	Still Present		175
Sparrow Hawk	Previous Period	25	1/1-3/1	Still Present		2,000

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

MIGRATORY BIRDS
(Other than Waterfowl)

Months of **January** to **April** 19 **71**

(over)

NR-1A From _____ to _____ 19____
5RF-2/71

	(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove	Previous Period	200	3/1-4/30	Still Present		15,000
White-winged dove						
IV. Predaceous Birds:						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow, Common	Previous Period	25	3/1-4/30	Still Present		2,500
Barn Owl	Previous Period	25	1/1-4/30	Still Present		1,500
Screech Owl	Previous Period	20	1/1-3/1	Still Present		1,250
Great Horned Owl	Previous Period	30	1/1-4/30	Still Present		3,600
Barred Owl	Previous Period	10	1/1-4/30	Still Present		1,200
Short-eared Owl	Previous Period	15	1/15-3/1	1	3/12	1,100
Crow, fish	5 2/21	25	3/1-4/30	Still Present		1,500

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form 1 LA
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Prime Hook

Months of May to August 19 71

(1)	(2)		(3)		(4)		(5)			(6)
Species	First Seen		Peak Concentration		Last Seen		Production			Total
Common Name	Number	Date	Number	Inclu- sive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	Previous Period		20	5/1-8/31	Still Present					2,400
Great Blue Heron	Previous Period		25	7/1-8/31	Still Present					2,400
Green Heron	Previous Period		100	7/5-8/31	Still Present					8,000
Cattle Egret	11	5/3	100	8/17-31	Still Present					3,000
Common Egret	1	5/3	20	7/5-8/15	Still Present					750
Snowy Egret	Previous Period		25	7/5-8/15	Still Present					1,000
Black-crowned Night Heron	Previous Period		25	8/15-31	Still Present					600
Least Bittern	5	5/5	100	6/1-7/31	Still Present					8,000
American Bittern	Previous Period		50	6/1-8/31	Still Present					6,000
Glossy Ibis	Previous Period		50	5/15-31	Still Present					1,200
King Rail	Previous Period		50	7/1-8/31	Still Present					4,000
Clapper Rail	Previous Period		300	7/1-8/31	Still Present					20,000
Virginia Rail	Previous Period		100	7/1-8/31	Still Present					10,000
Common Gallinule	Previous Period		10	8/1-31	Still Present					500
II. <u>Shorebirds, Gulls and Terns:</u>										
Semipalmated Plover	4	5/24	15	7/15-8/15	Still Present					600
Killdeer	Previous Period		25	7/15-8/15	Still Present					2,500
American Golden Plover	14	8/14	14	8/14	14	8/14				14
Black-bellied Plover	Previous Period		75	5/10-25	Still Present					1,200
Ruddy Turnstone	Previous Period		5	7/5-8/31	Still Present					275
American Woodcock	Previous Period		100	6/1-7/31	Still Present					9,000
Common Snipe	Previous Period		10	8/15-31	Still Present					250
Upland Plover	1	5/10	2	8/17	2	8/17				3
Spotted Sandpiper	1	5/5	25	7/15-8/15	Still Present					2,000
Willet	Previous Period		200	6/15-7/15	2	7/29				13,000
Greater Yellowlegs	Previous Period		15	7/5-8/15	Still Present					600
Lesser Yellowlegs	Previous Period		10	7/5-8/15	Still Present					400

(over)

NR-1A From May to August 19 71

SRF-2/71

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove	Previous Period	350	7/15-8/31	Still Present	30,000
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow, common	Previous Period	50	7/1-8/31	Still Present	5,000
Red-tailed Hawk	Previous Period	10	6/1-8/21	Still Present	1,200
Red-shouldered Hawk	Previous Period	5	6/1-8/31	Still Present	600
Marsh Hawk	Previous Period	5	8/1-31	Still Present	350
Osprey	Previous Period	4	5/1-7/31	2 8/15	400
Sparrow Hawk	Previous Period	12	6/1-8/31	Still Present	1,200
Barn Owl	Previous Period	6	6/1-8/31	Still Present	600

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form 1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge **Prime Hook**

Months of **May** to **August** 19 **71**

[illegible]

(over)

NR-1A From **May** to **August** 19**71**

5RF-2/71

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove						
White-winged dove						
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow, fish						
Screech Owl	Previous Period	50	8/1-31	Still Present		2,800
	Previous Period	8	8/1-8/31	Still Present		800
Great Horned Owl	Previous Period	20	5/1-8/31	Still Present		2,400
Barred Owl	Previous Period	10	4/1-8/31	Still Present		1,000

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form 1 1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge **Prime Hook**

Months of **May** to **August** 19 **71**

(1)	(2)		(3)		(4)		(5)			(6)
Species	First Seen		Peak Concentration		Last Seen		Production			Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
II. <u>Shorebirds, Gulls and Terns:</u>										
Ring-billed Gull	Previous	Period	5	7/15-8/31	Still	Present				350
Laughing Gull	Previous	Period	50	8/15-31	Still	Present				800
Forster's Tern	5	7/1	10	7/15-8/31	Still	Present				900
Least Tern	5	5/24	5	5/24	Still	Present				150

(over)

NR-1A From **May** to **August** 19**71**

5RF-2/71

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove					
White-winged dove					

IV. Predaceous Birds:
 Golden eagle
 Duck hawk
 Horned owl
 Magpie
 Raven
 Crow

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Prime Hook Months of September to December 19 71

(1)	(2)		(3)		(4)		(5)			(6)
Species	First Seen		Peak Concentration		Last Seen		Production			Total
Common Name	Number	Date	Number	Inclu- sive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Pied-billed Grebe	Previous	Period	20	9/1-10/31	Still	Present				2,000
Great Blue Heron	Previous	Period	25	9/1-11/15	Still	Present				2,500
Green Heron	Previous	Period	100	9/1-21	1	9/30				2,500
Cattle Egret	Previous	Period	50	9/1-21	1	11/18				1,100
Common Egret	Previous	Period	5	9/1-10/15	1	12/13				250
Snowy Egret	Previous	Period	10	9/1-10/15	1	11/2				500
Black-crowned night heron	Previous	Period	25	9/1-30	Still	Present				1,100
Least Bittern	Previous	Period	50	9/1-15	5	10/7				1,000
American Bittern	Previous	Period	50	9/1-15	Still	Present				1,500
Glossy Ibis	Previous	Period	10	9/1-15	3	11/18				175
King Rail	Previous	Period	100	9/15-10/15	Still	Present				5,000
Clapper Rail	Previous	Period	300	9/1-10/15	Still	Present				18,000
Virginia Rail	Previous	Period	150	9/15-10/15	Still	Present				7,500
Sora	50	9/1	100	9/15-10/15	10	10/31				5,000
Common Gallinule	Previous	Period	10	9/1-15	5	10/15				200
II. Shorebirds, Gulls and Terns:										
Semipalmated Plover	Previous	Period	7	9/4	2	9/29				50
Killdeer	Previous	Period	100	11/1-7	Still	Present				3,000
American Golden Plover	8	9/16	19	9/29	3	11/2				75
Black-bellied Plover	Previous	Period	11	9/4	2	12/13				800
Ruddy Turnstone	Previous	Period	5	10/12	Still	Present				100
American Woodcock	Previous	Period	250	11/1-15	Still	Present				10,000
Common Snipe	Previous	Period	300	10/15-11/15	Still	Present				15,000
Spotted Sandpiper	Previous	Period	3	9/4	1	10/18				25
Solitary Sandpiper	2	9/4	2	9/4	2	9/4				2
Greater Yellowlegs	Previous	Period	10	11/2	1	11/12				500
Lesser Yellowlegs	Previous	Period	25	9/16	4	11/2				750
Pectoral Sandpiper	Previous	Period	50	9/16	3	9/29				750
White-rumped Sandpiper	Previous	Period	5	9/29 (over)	5	9/29				25

NR-1A From September to December 19 71
SRF-2/71

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove	Previous Period	500	10/1-31	Still Present		30,000
White-winged dove						
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow, Common	Previous Period	50	9/1-11/15	Still Present		3,700
Red-tailed Hawk	Previous Period	8	9/15-12/31	Still Present		900
Red-shouldered Hawk	Previous Period	5	9/1-30	Still Present		400
Rough-legged Hawk	2 11/12	6	12/1-31	Still Present		225
Marsh Hawk	Previous Period	30	11/1-12/31	Still Present		2,200
Sparrow Hawk	Previous Period	25	10/1-31	Still Present		2,000
Barn Owl	Previous Period	8	9/1-12/31	Still Present		960

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Prime Hook

Months of September to December 19 71

(1)	(2)		(3)		(4)		(5)			(6)
Species	First Seen		Peak Concentration		Last Seen		Production			Total
Common Name	Number	Date	Number	Inclu- sive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove						
White-winged dove						
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow, fish	Previous Period	75	9/15-30	Still Present		1,500
Screech Owl	Previous Period	20	11/1-12/31	Still Present		1,250
Great Horned Owl	Previous Period	30	11/1-12/31	Still Present		3,000
Barred Owl	Previous Period	10	9/1-12/31	Still Present		960
Short-eared Owl	1 11/15	5	12/1-30	Still Present		175

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form 1 LA
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Prime Hook

Months of September to December 19 71

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclu- sive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
II. <u>Shorebirds, Gulls and Terns:</u>										
Forster's Tern	Previous	Period	10	9/1-7	1	9/15				100
Least Tern	Previous	Period	5	9/1-7	5	9/7				35
Black Tern	2	9/4	2	9/4	2	9/4				2

(over)

NR-1A From September to December 19 71

5RF-2/71

(1)	(2)	(3)	(4)	(5)	(6)
-----	-----	-----	-----	-----	-----

III. Doves and Pigeons:

Mourning dove
White-winged dove

IV. Predaceous Birds:

Golden eagle
Duck hawk
Horned owl
Magpie
Raven
Crow

INSTRUCTIONS

See Wildlife Refuges Manual Section 3321-24, "Wildlife Records".

If more space is needed for listing species in Group I, you can X out heading for Group II and continue listing. Retype heading of Group II below, or list Group II on a second page. Here, too, if the list is long, you can X out both headings and retype heading for Group II at top of form. This can eliminate the necessity for a third page of form.

Explanation of column headings:

- (1) Species: Use correct names as found in the A.O.U. Checklist.
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Prime Hook For 12-month period ending August 31, 19 71

Reported by N. Holgersen Title Wildlife Biologist

(1) Area or Unit Designation	(2) Habitat Type Acreage		(3) Use-days	(4) Breeding Population	(5) Production
#1	Crops	99	Ducks	22,940	65
	Upland	141	Geese	99,750	86
	Marsh	1,540	Swans		
	Water	70	Coots		
	Total	1,850	Total	122,690	
<hr/>					
#2	Crops	272	Ducks	111,275	140
	Upland	158	Geese	363,205	287
	Marsh	1,488	Swans		
	Water	150	Coots	105	
	Total	2,068	Total	474,585	
<hr/>					
#3	Crops	207	Ducks	108,240	190
	Upland	193	Geese	245,035	272
	Marsh	4,346	Swans		
	Water	600	Coots	70	
	Total	5,346	Total	353,345	
<hr/>					
#4	Crops		Ducks	64,145	80
	Upland	240	Geese	307,995	115
	Marsh	1,084	Swans		
	Water	120	Coots		
	Total	1,444	Total	372,140	
<hr/>					
Total	Crops	578	Ducks	306,600	475
	Upland	732	Geese	1,015,985	760
	Marsh	8,458	Swans		
	Water	940	Coots	175	
	Total	10,708	Total	1,322,760	475
<hr/>					
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
<hr/>					
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1750c
Form R-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Prime Hook

Year 19 71

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species	(5) No. Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. Hunters	(9) Est. Total Kill
7			Green-winged teal	334				
			Black duck	108				
			Hallard	80				
			Canada geese	66				
			Blue-winged teal	47				
			Ruffianhead	41				
			Wood duck	29				
			Haldgate	20				
			Coot	19				
			Flarebill	18				
			Scup	16				
			Ring-necked duck	15				
			Red-breasted merganser	13				
			Gadwall	12				
			Redhead	5				
			Shoveller	5				
			Goldeneye	3				
			Brent	2				
			Hooded merganser	2				
			Old Squaw	2				
			Carrack	1				
			Unidentified	12				
TOTALS:	1,571	9,126		850	200	1,050	1,521	1,050

INSTRUCTIONS

- (1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.
- (2) The goal is to survey a minimum of 25 per cent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 per cent goal cannot be achieved, particular care should be taken to collect representative data.
- (3) Record the total number of hours the hunters spend hunting on the refuge.
- (4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).
- (5) Record total numbers of waterfowl bagged.
- (6) Record total numbers of waterfowl reported knocked down but not recovered.
- (7) Total of Columns 5 and 6.
- (8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).
- (9) Kill sample projected to 100 per cent.
$$\text{Column 9} = \frac{\text{Column 8}}{\text{Column 2}} \times \text{Column 7}.$$

REPORT OF BANDING ON Prime Hook REFUGE - CALENDAR YEAR 71

Geese	Method of	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Canada	Trapping*													
Brant														
Ducks														
Mallard														
Black	Cage								43	18	6			67
Gr.-Winged Teal	Cage									10	19			29
Bl.-Winged Teal	Cage									42	22			64
Wood Duck														
Pintail	Cage									10	2			12
Eider														
Total Waterfowl														172
Other														
Mourning Dove														
Woodcock														

Quotas: Canada geese _____; Mallard _____; Blacks _____; Other _____

*Method of Trapping: CAN - Cannon Net; CAGE - Cage; MIST - Mist Net; NITE - Night-lighting

3-1752
 For. NR-2
 (April 1946)

UPLAND GAME BIRDS

Refuge Prime Hook Months of January to April 19 71

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	per- centage	Hunting	For Re- stocking	For Research	Esti- mated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	1,300 acres upland, marsh and woodland edge	5			1:1	50			250	Estimates based on bag checks and random field observations by Refuge Personnel.
Ring-necked Pheasant	1,300 acres upland, marsh and woodland edge	85			9:1				15	Estimate based on field observations by Refuge Personnel.

NR-2 - Upland Game Birds - Months of January to April, 1971

5RF-2/71

3-1752
 For. NR-2
 (April 1946)

UPLAND GAME BIRDS

Refuge Prime Hook

Months of May to August 19 71

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	per- centage	Hunting	For Re- stocking	For Research	Esti- mated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	1,300 acres of upland marsh and woodland edge	2.6	12	300	50:50				500	Estimates based on random field observations.
Ring-necked Pheasant	1,300 acres of upland marsh and woodland edge	43	0	20	70:30				30	Estimates based on random field observations.

NR-2 - Upland Game Birds - Months of May to August

5RF-2/71

3-1.1
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Prime Hook

Months of September to December 19 71

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	per- centage	Hunting	For Re- stocking	For Research	Esti- mated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	1,300 acres of upland marsh and woodland edge	2.6	3	100	50:50	100			500	
Ringnecked Pheasant	1,300 acres of upland marsh and woodland edge	43	-	12	9:1	90			30	A total of 110 cock birds were released by the State for a Special Season.

7-1753
 Form NR-3
 (June 1945)

BIG GAME

Refuge Prine Hook Calendar Year 1971

(1) Species	(2) Density	(3) Young Produced	(4) Removals			(5) Losses			(6) Intro- ductions	(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, Total Acres Habitat	Number	Hunting	Restocking	Research	Predation	Disease	Winter Loss	Number and Source	Period of Peak Use	As of Dec. 31	
Whitetailed Deer	6,355 acres of upland, marshland, and woodland	25	12							60	30	1:1

Remarks:

NR-3
 5RF 1/69

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Prime Hook

Year ending April 30, 1971

(1) Species	(2) Density		Removals						(4) Disposition of Furs					(5)
Common Name	Cover Types and Total Acres of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control	Restocking	For Research	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula- tion
								Permit Number	Trappers Share	Refuge Share				
Eastern Gray Squirrel	300 Timber	23	75											200
Southern Flying Squirrel	300 Timber	60												50
Eastern Cottontail Rabbit	1,300 Upland	3	200											500
Woodchuck	1,300 Upland	9												150
Opossum	1,300 Upland	6												200
Striped Skunk	1,300 Upland	13												100
Muskrat	3,500 Marsh & Water	4												1,000
River Otter	4,600 Marsh & Water	180												25
Red Fox	6,000 Upland & Marsh	80												75
Gray Fox	6,000 Upland & Marsh	240												25
Raccoon	6,000 Upland & Marsh	40												150
Longtail Weasel	6,000 Upland & Marsh	60												100

REMARKS:

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprime-ness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

DISEASE

Refuge Prime Hook Year 19 71

Botulism

Lead Poisoning or other Disease

Period of outbreak None

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease Lead PoisoningSpecies affected Canada Geese

Number Affected

Species	Actual Count	Estimated
<u>Canada Geese</u>	<u>30</u>	<u>60</u>
_____	_____	_____
_____	_____	_____

Number Recovered -Number lost 60Source of infection Lead pelletsWater conditions Above normalFood conditions Aquatics, green brown and waste grain were in ample supply.Remarks Source of ingested lead is unknown; it is doubtful that Unit IV contributes to the problem even though the majority of the afflicted birds are found there.

Bureau of Sport Fisheries and Wildlife
Division of Wildlife Refuges

MONTHLY RECREATIONAL USE REPORT

Refuge name

Prime Hook

State

Delaware

State
Code 08
(1-2)

Congressional
District Code 00
(3-4)

Refuge
Code 902
(5-7)

Report Yr. | Mo.
Period 7 | 4
(8-11)

(Card Columns). (12-13) (14-18) (19-25)			
ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours
Hunting: Big Game	01	<u>520</u>	<u>1,300</u>
Upland Game	02	<u>1,455</u>	<u>4,365</u>
Waterfowl	03	<u>1,401</u>	<u>8,766</u>
Other Migratory	04		
Other (for other)	05	<u>50</u>	<u>50</u>
Bow	06	<u>105</u>	<u>315</u>
Fishing: Salt Water	07	<u>2,930</u>	<u>5,860</u>
Warm Water	08	<u>1,510</u>	<u>4,530</u>
Cold Water	09		
Environmental Education	10		
Wildlife Photography	11	<u>85</u>	<u>170</u>
Wildlife Observation	12	<u>1,250</u>	<u>6,400</u>
Conducted Programs	13		
Field Trials	14		
Wildlife Trails	15		
Wildlife Tours/Routes	16	<u>50</u>	<u>50</u>
Visitor Contact Stations	17	<u>2,590</u>	<u>1,480</u>
Camping (wildlife related)	18		
Picnicking (wildlife related)	19		
Wildlife Interpretive Center	20	<u>66</u>	<u>12</u>
Off-Site Programs	21		

(Card Columns). (12-13) (14-18) (19-25)			
ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours
On-Site Programs	22	<u>3</u>	<u>12</u>
*Miscellaneous Wildlife	23		
Swimming	24		
Boating	25	<u>435</u>	<u>870</u>
Water Skiing	26		
Camping	27		
Group Camping	28		
Picnicking	29	<u>245</u>	<u>245</u>
Horseback Riding	30	<u>70</u>	<u>70</u>
Bicycling	31	<u>95</u>	<u>95</u>
Winter Sports (skating)	32	<u>10</u>	<u>20</u>
Fruit, Nut and Vegetable Collecting	33	<u>60</u>	<u>120</u>
*Miscellaneous Non-Wildlife	34		
Peak Load Day	35	<u>250</u>	
Actual Visits	36	<u>8,350</u>	
Fee Area Use	37		
Number of Fee Areas	38	(14-18)	
Fee Collections	39	\$	
Collection Costs	40	\$	

3-175^R

Form -8

(Rev. Jan. 1956)

5RF-10/64

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge

Prime Hook

County

Sussex

State

Delaware

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Field Corn (Cereal)	315	13,800 bu.			5	200 bu.	350	Wheat Broom	76
Soybean (Cereal)	49	125 bu.					49	Rye-Grass Cover Crop	194
Winter Wheat (Broom)					76		76	Rye Broom	105
Sorghum (Cereal)					4		4	Semi-permanent Grasslands	360
Buckwheat (Cereal)					8		8	Buckwheat (Cereal)	8
Wildlife Pasture (Broom)					11		11	Sorghum (Cereal)	4
								Fallow Ag. Land	
								Field #321	46

No. of Permittees: Agricultural Operations 5 Haying Operations 2 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE	
Alfalfa Pasture Hay ¹ ¹ Harvested as a "Special Condition" under a Cooperative Farming Agreement.	120 2	11 2	275.00	1. Cattle	282 ⁰⁰⁰	1,441	\$1,993.00	360	
				2. Other	or - Over 6 mo. of age				
				1. Total Refuge Acreage Under Cultivation					614
Hay - Wild	15	15	30.00	2. Acreage Cultivated as Service Operation					382

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or state.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Refuge

Prime Hook

Proposal Number
PH-71-2

Reporting Year
1971

Dates of Application (1)	List of Target Pests(s) (2)	Location of Area Treated (3)	Total Acres Treated (4)	Chemical(s) Used (5)	Total Amount of Chemical Applied (6)	Application Rate (7)	Carrier and Rate (8)	Method of Application (9)
June 15 thru July 15	Broad-leaved weeds	Fields #309, 310, 311, 312, 314, 318, 326	124	2,4-D low volatile ester	62 lbs. a.e.	.05 lbs. a.e.	Water 10-30 gal. per acre	Boom Sprayer
	"	Fields #306, 307	22	"	11 lbs. a.e.	"	"	"
	"	Fields #205, 301	42	"	21 lbs. a.e.	"	"	"
	"	Fields #101, 102, 201, 202	146	"	73 lbs. a.e.	"	"	"

10. Summary of results (continue on reverse side, if necessary)

Control was satisfactory.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prine Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number
PH-71-3

Reporting Year
1971

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Dates of Application	List of Target Pests(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June 11	Johnsongrass	Fields #312, 313, 314, 318	2	Dalapon	16 lbs. a.e.	8 lbs. a.e./A.	Water 50 gal./A.	Drop nozzle and hand wand
June 18 - July 1	Johnsongrass	Field #321	30	Dalapon	180 lbs. a.e.	6 lbs. a.e./A.	Water 50 gal./A.	Drop nozzle
June 15	Johnsongrass	Fields #301, 312, 314, 318	2	Dalapon	16 lbs.a.e.	8 lbs. a.e./A.	Water 50 gal./A.	Drop nozzle and hand wand

10. Summary of results (continue on reverse side, if necessary)

The mechanical/chemical Johnsongrass-control of Field #321 appeared to keep the weed in check this year; the spraying cause the leave blades to become spotted and shriveled; subsequent disking and plowing prevented the development of seed heads.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number
PA-71-4

Reporting Year
1971

Dates of Application	List of Target Pests(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
July 2	Phragmites	Boundary signs along public highways, all Units	1	Dalapon	6 lbs. a.e.	6 lbs. a.e./A.	Water 40 gal./A.	Handhand

10. Summary of results (continue on reverse side, if necessary)

Satisfactory control.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number

PR-71-5

Reporting Year

1971

Dates of Application	List of Target Pests(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June 5 & July 1	Gross, broad-leaved weeds	Headquarters	.12	Urethor (dry granular)	15 lbs.	10 lbs./1000 sq. ft.	-	Hand spread

10. Summary of results (continue on reverse side, if necessary)

Satisfactory results. Chemical employed to prevent weed growth next to buildings and on parking areas to enhance appearance and to decrease fire hazards.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number

PA-71-5

Reporting Year

1971

Dates of Application (1)	List of Target Pests(s) (2)	Location of Area Treated (3)	Total Acres Treated (4)	Chemical(s) Used (5)	Total Amount of Chemical Applied (6)	Application Rate (7)	Carrier and Rate (8)	Method of Application (9)
June 1	Annual grasses, broad-leaved weeds	Fields #106 and 107	49	Trifluralin	25 lbs. a.e.	.5 lbs. a.e./A.	Water 30 gal./A.	Boom sprayer

10. Summary of results (continue on reverse side, if necessary)

Poor results due to copious rainfall.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number
PH-71-7

Reporting Year
1971

Dates of Application	List of Target Pests(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
August 20	Purple loosestrife	Marsh in north-eastern quarter of Unit II.	1	Ammonium sulfamate (Amate X)	60 lbs.	60 lbs./A.	Water 100 gal./Acre	Bean sprayer, handgun.
August 24 & 25	Purple loosestrife	Marsh in south-east quarter of Unit I and north-east quarter of Unit II.	.5	Ammonium sulfamate (Amate X)	30 lbs.	30 lbs./A.	Water 50 gal./Acre	Bean sprayer, handgun.

10. Summary of results (continue on reverse side, if necessary)

Excellent above-ground results; long-term effect on root system still questioned.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number
PR-71-9

Reporting Year
1971

Dates of Application (1)	List of Target Pests(s) (2)	Location of Area Treated (3)	Total Acres Treated (4)	Chemical(s) Used (5)	Total Amount of Chemical Applied (6)	Application Rate (7)	Carrier and Rate (8)	Method of Application (9)
May 22	Saltmarsh mosquito (<u>Aedes sollicitans</u>)	Northeast quarter of Unit 1, central southern portion of Unit 3 and small area in northwestern quarter of Unit 4.	450	Abate 4E	21.6 lbs.	.048 lbs./A.	.5 gal. water/A.	Airplane

10. Summary of results (continue on reverse side, if necessary)

Control was good with 30 to 50 larvae per dip prespray and 1 to 7 per dip post-spray.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number

PR-71-10

Reporting Year

1971

Dates of Application (1)	List of Target Pests(s) (2)	Location of Area Treated (3)	Total Acres Treated (4)	Chemical(s) Used (5)	Total Amount of Chemical Applied (6)	Application Rate (7)	Carrier and Rate (8)	Method of Application (9)
August 11	Salt-marsh mosquito (<u>Aedes sollicitans</u>)	West central portion of Unit 1	100	Abate 2% Granular	10 lbs.	0.1 lbs./A.	Celeston 5 lbs./A.	Airplane
August 31	Salt-marsh mosquito (<u>Aedes sollicitans</u>)	Unit 1 east of Slaughter Creek and northeast corner of Unit 4	1,075	Abate 2% Granular	107.5 lbs.	0.1 lbs./A.	Celeston 5 lbs./A.	Airplane

10. Summary of results (continue on reverse side, if necessary)

August 11: No check.

August 31: Excellent control with 10 to 100 larvae per dip prespray and 1 to 2 per dip post-spray.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number
FH-71-11

Reporting Year
1971

Dates of Application	List of Target Pests(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June 4	Salt-marsh mosquito (<u>Aedes sollicitans</u>)	Unit 1 east of Slaughter Creek	775	Abate 4E, ULV	37.2 lbs.	.048 lbs./A.	None	Airplane
August 2	Salt-marsh mosquito (<u>Aedes sollicitans</u>)	Southeastern quarter of Unit 3 and northern third of Unit 4	1,350	Abate 4E, ULV	64.8 lbs.	.048 lbs./A.	None	Airplane
September 1	Salt-marsh mosquito (<u>Aedes sollicitans</u>)	Southeastern corner of Unit 3 and part of northwestern quarter of Unit 4	1,200	Abate 4E, ULV	57.6 lbs.	.048 lbs./A.	None	Airplane

10. Summary of results (continue on reverse side, if necessary)

June 4: Control poor with 5 to 12 larvae per dip prespray and 5 to 10 per dip postspray.

August 2: Control good with 10 to 130 larvae per dip prespray and 5 per dip postspray.

September 1: Control good with 25 to 75 larvae per dip prespray and 2 to 5 per dip postspray.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Prime Hook

ANNUAL REPORT OF PESTICIDE APPLICATION

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395

Proposal Number
PH-71-12

Reporting Year
1971

Dates of Application (1)	List of Target Pests(s) (2)	Location of Area Treated (3)	Total Acres Treated (4)	Chemical(s) Used (5)	Total Amount of Chemical Applied (6)	Application Rate (7)	Carrier and Rate (8)	Method of Application (9)
September 6	Salt-marsh mosquito (<u>Aedes sollicitans</u>)	Eastern half of Unit 4 and extreme southeast corner of Unit 3.	640	Dibrom ULV	640 fl. oz.	1 fl. oz./A.	None	Airplane

10. Summary of results (continue on reverse side, if necessary)

Control was good with reduction in wing count from 8 to 10 adults to 1 to 0.

Farmers faced extremes

By G. WALLACE CAULK

Secretary

State Department of Agriculture

1971 was a year of extremes for Delaware's agricultural industry.

Farmers experienced excellent results in early grains, vegetables, fruits and dairying but suffered from extremely unfavorable fall weather which adversely affected the yield of corn, the state's largest cash crop.

As a result, the total farm income for the year may be no better than the \$147 million posted in 1970, when final figures are known.

Flooded fields in some areas plus soggy, humid weather throughout October and November made it difficult for farmers to harvest their corn and soybeans. Only their ingenuity and persistence in harvesting under adverse conditions kept losses from being even higher.

CONCERNED for the financial welfare of those farmers who lost a major portion of their crop income, Gov. Russell W. Peterson requested the U.S. secretary of agriculture to declare the state an agricultural disaster area.

It was so classified, making those farmers who had suffered losses eligible for emergency loans from the Farmers Home Administration to cover operating expenses during 1972. These loans carry about 5 per cent interest, lower than at other lending sources.

The poultry industry, which annually accounts for over half of Delaware's farm income, operated at full strength throughout most of the year. However, it still was plagued by the continuing cost-price squeeze and the national oversupply of poultry on the market.

Delaware's corn crop, which annually is the largest cash commodity with income of about \$15 million, suffered from leaf blight and poor harvest weather. The reduced yield contrasted to a bumper yield in the rest of the nation. As a result, our farmers received 20 to 25 cents per bushel less than last year.

SOYBEANS, second largest

state crop with an annual income of about \$10 million, experienced excellent yield in some areas and poor in others. With prices averaging close to \$2.50 per bushel, the crop should end up not far below normal for the year.

Delaware potato growers had another good year in 1971 with the crop accounting for some 7,000 acres and close to \$4 million in income. Early in the year, yield and prices were good. Total production was reduced in the fall when some of the late crop was not harvested due to muddy fields.

Vegetables for fresh market and processing, including lima beans, snap beans, tomatoes, green peas, asparagus, peppers and cucumbers, experienced a good year with yields and prices up to normal. It should be pointed out that farmers are rapidly turning toward those vegetables which can be harvested mechanically. This is because of the scarcity and high cost of manual labor used in hand picking.

IT is felt that the location of

a major pickle processing plant at Millsboro by Vlasic Corp. will provide a larger market for locally grown cucumbers. The crop accounted for some \$375,000 last year. This amount could be easily doubled in the near future.

Delaware's apple and peach growers experienced fine results last year. Favorable conditions resulted in the production of some 330,000 bushels of apples and 80,000 bushels of peaches. The combined income from these fruits was over \$1 million.

For the second year in a row Delaware's dairy industry was a bright spot in the farm economy. Milk production remained high and the price received by producers ranged between \$6.50 and \$6.75 per hundredweight throughout most of the year. Milk income amounted to about \$9 million.

AGRIBUSINESS, made up of producers, processors, distributors, suppliers and related firms, is the state's largest industry. Today's average farmer produces enough food to feed himself and almost 50

other persons, at prices far lower than in any other country.

Everything possible must be done at all levels of government to encourage the growth and prosperity of this most basic industry in Delaware, as throughout the nation.

One problem that concerns most agricultural leaders is the continuing loss of some of our most productive farm land to housing developments and highways.

They warn that agriculture cannot be expected to provide ample food at economical cost without the prime requisite, sufficient fertile land.

Pa. trio held in alleged 'contract' killing attempt

By PHIL MILFORD

SLAUGHTER BEACH — Two Chester, Pa., men were arrested yesterday for allegedly attempting to carry out the "contract" killing of a 31-year-old Slaughter Beach man near here.

State police at Dewey Beach said Louis A. Carletti, 28, of the 3000 block W. 9th St., and Gurney K. Bell, 25, of the 3000 block W. 10th St., were being held under \$35,000 bail each last night in Sussex Correctional Institution in connection with the attempted slaying of Howard M. Scholes, 31, of Slaughter Beach.

POLICE said the men told them they were hired to kill Scholes, who was unhurt, by

Nicholas Mattero, 47, of the 100 block Keystone Road, Upper Chichester Township, Pa. Mattero, also arrested, was being held by Upper Chichester Township Police last night pending extradition hearings.

Troopers at Dewey Beach gave the following account of the incident, which allegedly occurred on Delaware 224 between Slaughter Beach and Argos Corner about 7:10 a.m. yesterday:

Scholes was driving west when the two suspects drove alongside his car and fired two shotgun blasts at him. The pellets hit his car, but did not injure him. The gunmen then sped away.

Scholes stopped at a nearby

house and called police who activated a massive search plan involving roadblocks, the state police helicopter, and various police from other areas.

About 7:55 a.m. the men were spotted driving west on Delaware 16 near Ellendale. Police on the ground and in the air moved in and apprehended Carletti and Bell. They were then taken to Magistrate Court 2 at Lewes and charged with assault with intent to commit murder and conspiracy to commit murder.

Mattero was apprehended later yesterday after a warrant for his arrest was issued.

Police said they were withholding details of a motive for the alleged assassination attempt due to legal constraints.

3 boys held in car theft, break-ins

From the Sussex Bureau

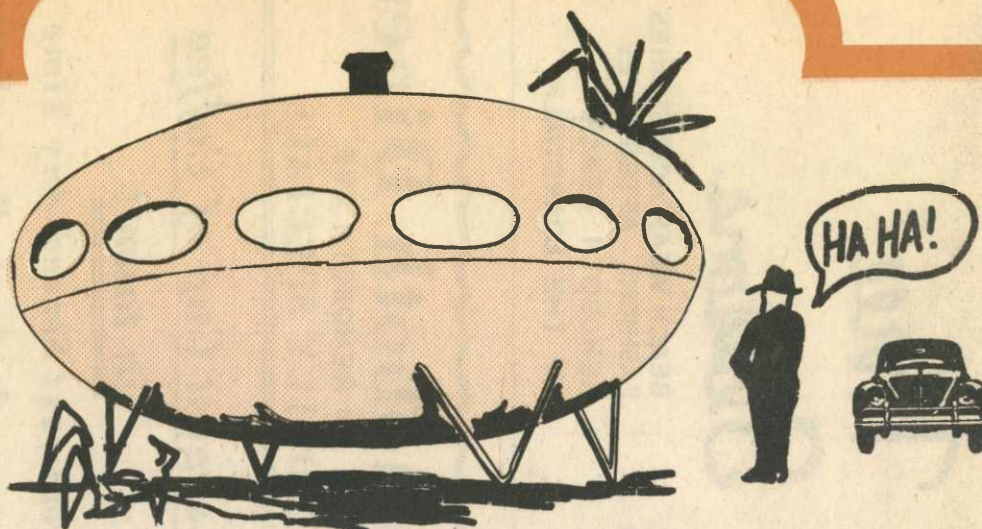
DEWEY BEACH — Three 15-year-old boys have been arrested in connection with the theft of a car and breaking of several cottages, state police said yesterday.

Two of the boys are from Milton and the third, from Mechanicsburg, Va., was visiting a sister in Milton.

They are being held in the Stevenson Detention Center, Milford, pending appearance in Family Court.

According to police, the three stole a car on Friday, which they later abandoned south of Milton after driving to Prime Hook Beach and Broadkill Beach, where they broke into two cottages.

Police said the youths are accused of running down highway signs, nail boxes and ramming into a farm building near Milton.



THEY LAUGHED THE FIRST TIME THEY SAW THE VOLKSWAGEN

It doesn't get 30 miles to the gallon, but the Futuro II, is the most technologically advanced housing unit on the market today. It is both durable and practical and is designed to be virtually maintenance free.

The Futuro II - a Finnish designed fiberglass modular home - can be purchased as empty as an eggshell or completely furnished with its wall hugging 23 foot sofa, deep shag carpets, dimmer controlled lighting, and hooded fireplace that

doubles as a barbecue grill. The floorplan is exceptionally compact; a combination kitchen - dining - living area makes up two-thirds of the Futuro, with the remainder well utilized as a bedroom and bath. The Futuro is virtually maintenance free; its sealed-up saucer shape and unique ventilation system with air conditioning standard equipment all but eliminate dust and humidity.

An elliptical two bedroom, two bath model will soon be available for those with large families, and three or four units can be clustered by interlocking sections. The variations are limited only by your imagination.

Use the Futuro II as a pent house on an existing building, a motel unit, a guest house, or an office.

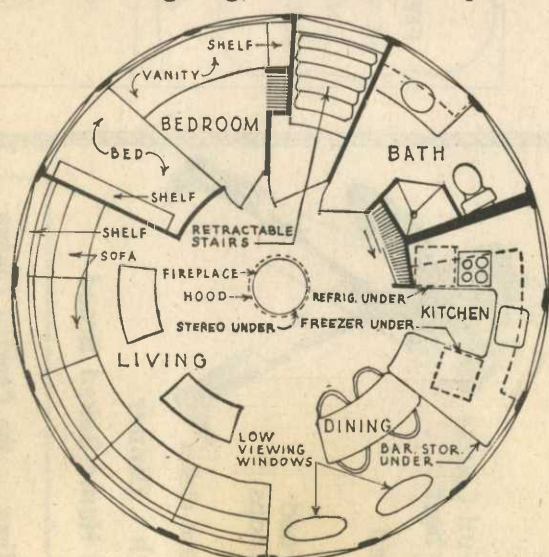
Remember the Futuro II comes completely furnished and air conditioned . . . ready to move into for years of maintenance free vacation pleasure.

1 bedroom model - completely furnished and air conditioned

\$15,600

2 bedroom, 2 bath model - furnished and airconditioned.

Complete! \$23,400



Contact Joseph Hudson 645-8675

Model Open at Five Points (Rt. 14 & Rt. 18) From 10 am til 9 pm daily

NEW DIMENSIONS, INC.

Circle the appropriate picture description:

- a. Burial of a thirty-foot anaconda.
- b. The founding of an underground organization.
- c. Installing a waterline to the shop.
- d. None of the above.

Nugent 5/26/71
PH-71-R4-11

An excellent growth of wild millet and common threesquare at
Trap Pond, Unit IV.

Holgerson 9/16/71
BH-6-71-16



Even a grave situation

Nugent 2/3/71
PH-71-R2-18

can have its brighter moments.

Nugent 4/13/71
PH-71-R3-1



A helpful arm (?) was extended by the State Highway Department in reditching the roadsides of Rt. 237 (Unit IV); the secondary road was subject to occasional tidal inundations.

=

Nugent 4/22/71
PH-71-R3-6

A traumatic experience, indeed, to have turned its hair white.

Nugent 11/20/71
PH-71-R5-19

Shunk



Broadkill Beach, facing north, following early February's sub-zero temperatures.

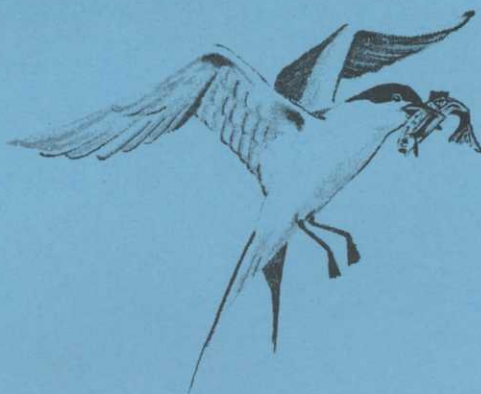
Nugent 2/3/71
PH-71-R2-2

An unworldly neighbor. (See enclosed advertisement for details.)

Nugent 2/3/71
PH-71-R2-6



Beautiful
Broadkill
each



"Home of the Tern"

Waterfront
LOTS AVAILABLE

**WHERE THE ATLANTIC OCEAN
MEETS THE DELAWARE BAY**

**BACK
BAY
Co.**

Office at Broadkill
Tel. (302) 684-4453
or (302) 856-2658

BEAUTIFUL BROADKILL BEACH



Situated on the clear blue waters of the Delaware Bay, Broadkill Beach is just 15 minutes from the nation's summer capitol, Rehoboth Beach.

To reach Broadkill Beach follow Route 16 (the main resort highway) to its end at the Delaware Bay Waterfront. Lush cedars, wild plum trees, yellow yuccas, the prickly pear cactus and other vegetation seem to transport you to a picturesque setting reminiscent of areas located considerably south of the Delaware Coast.

The wide, white sandy beach offers a perfect haven for the sunbather and swimming at Broadkill Beach is suited for both the beginner and the expert. The calm, cool salt water is perfect for an early morning dip or a lazy afternoon swim.

Broadkill Beach is surrounded by the Prime Hook National Wildlife Refuge which seals you away from the crowds and confusion of large commercial resorts. You will find that among your neighbors at Broadkill Beach you will list the white-tailed deer, raccoons, river otters, muskrats, woodchucks, gray squirrels plus a variety of herons, shorebirds and songbirds. They all live at Prime Hook and provide additional interest to your ownership at Beautiful Broadkill Beach. Canoeing over 15 miles of streams, boating in fresh water areas of Prime Hook and hiking through undisturbed wooded areas are all available in the refuge.

Broadkill Beach itself is the home of the tern, a species of lovely and graceful shorebirds that each spring fascinate residents and visitors alike as they make their nests in the open sand areas and raise their chicks in waterfront luxury.

For those who thirst for the adventure of exploring our country's past history, the city of Lewes, Delaware is only 10 minutes away by car. Lewes dates from 1631 when the Dutch Expedition planned by Captain David Pieterssen deVries brought the first settlers to the broad mouth of

(platted to house lots)

the Delaware Bay. It was named "Zwaanendael" (Valley of the Swans). Here you may visit the Zwaanendael Museum, the Cannonball House, the Thompson Country Store and the Burton Ingram and Rabbits Ferry Houses.



*Broadkill Beach, a place to remember
with times to remember . . .*

**SANDY BEACHES . . . SWIMMING . . . WATER SKIING . . .
SALT AND FRESH WATER FISHING . . .
CRABBING . . . HUNTING**

SEE FOR YOURSELF

**LAST PRIME WATERFRONT PROPERTY
AVAILABLE IN THE AREA**

LOTS: \$3,000 to \$15,400

Free title insurance . . . no closing costs
Beach Office open daily 11 a.m. — 5 p.m.
Sunday to 6 p.m.

DIRECTIONS: Take Route 14 Highway to Route 16.
Only 4 Miles East to Broadkill Beach . . . Office
located on North Beach . . . turn left at Broadkill
Store.

The Back Bay Co.
Tel.: 684-4453 or 856-2658 Area Code 302
Main Office:
The Thompson Building
The Circle
Georgetown, Delaware